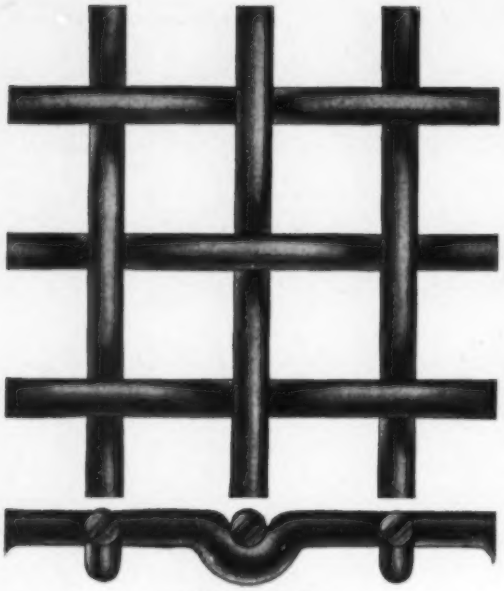
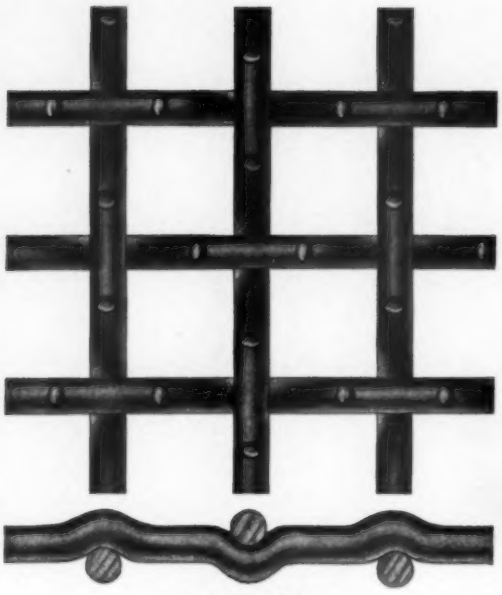
PIT AND QUARRY



STA-SMOOTH

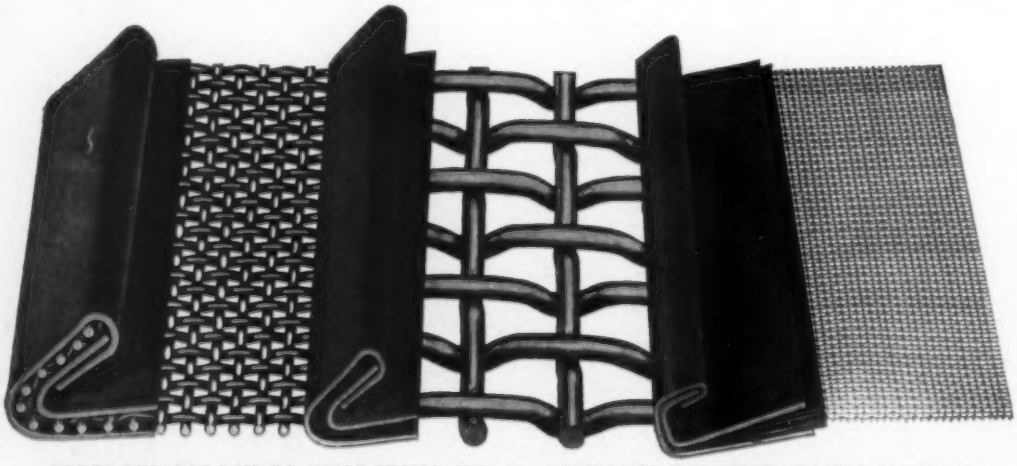


ARCH-CRIMP

SUPER-LOY VIBRATING-SCREEN SECTIONS

SUPER-HARD - - - SUPER-TOUGH - - - SUPER-STRONG

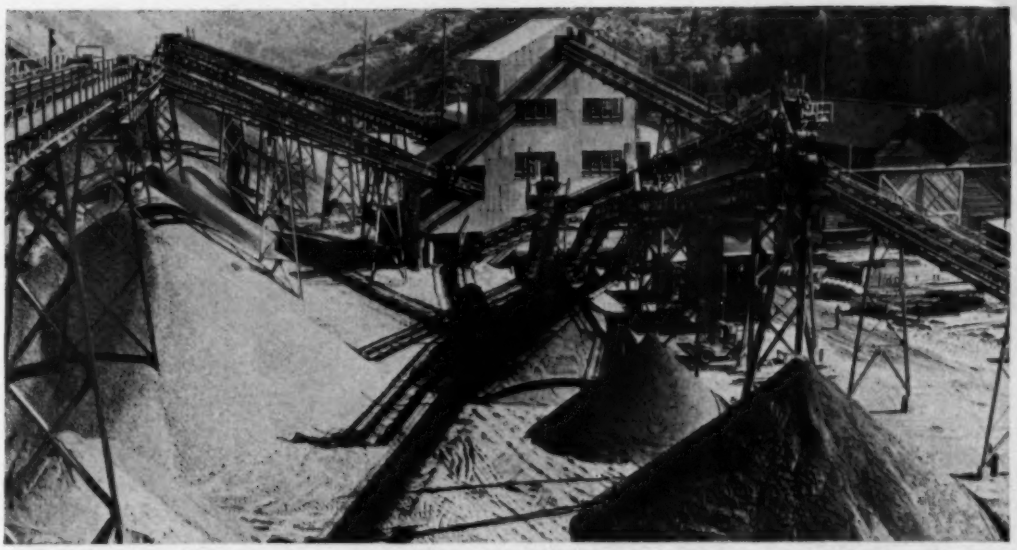
SUPER-LOY SCREENS are made from a high carbon steel specially alloyed to withstand abrasion longer — endure vibration better — resist fatigue to the utmost



ORDER LUDLOW-SAYLOR HOOK-STRIPS FOR ALL TENSIONED VIBRATING-SCREEN SECTIONS.

THE LUDLOW-SAYLOR WIRE COMPANY

634 S. Newstead Ave. ST. LOUIS 10, MO.



Part of the extensive Link-Belt belt conveyor system at the gravel preparation plant, Hungry Horse Dam, Montana.

Rely on one source... one responsibility for the best in belt conveyors

LINK-BELT engineering experience plus quality components combine to cut handling costs

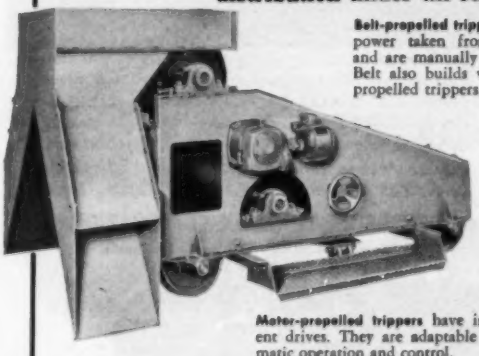
WHETHER you must move a few tons a day or several thousand tons per hour . . . whether the haul is measured in feet or miles—you'll find the answer in belt conveyors at Link-Belt.

Here's a nation-wide engineering organization that will follow through from start to finish—the designing, manufacturing, erecting of conveying equipment. And nowhere can you match Link-Belt's combination of vast application experience . . . complete line of quality components . . . expert coordination of related equipment.

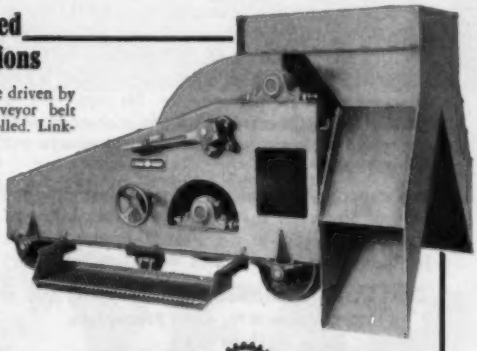
Get all the facts from the Link-Belt office near you. Link-Belt engineers are glad to work with you and your consultants—help you get the finest in belt conveyors.

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, Duluth, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities.

LINK-BELT Trippers offer controlled distribution under all conditions



Belt-propelled trippers are driven by power taken from conveyor belt and are manually controlled. Link-Belt also builds winch-propelled trippers.



Motor-propelled trippers have independent drives. They are adaptable to automatic operation and control.

12,689-F

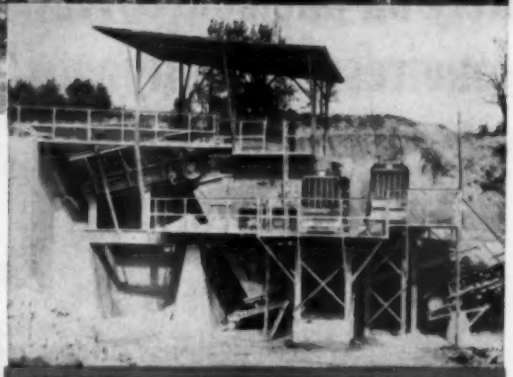
LINK-BELT

BELT CONVEYOR EQUIPMENT

PIT AND QUARRY, August, 1952, Vol. 45, No. 2. Published monthly by the Complete Service Publishing Company, 431 S. Dearborn Street, Chicago 5, Ill. Subscription price $3 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $3 additional for each year. Single copy 25 cents. Entered as second-class matter February 28, 1922, at the Post Office at Chicago, Ill., under the Act of March 3, 1879.

Fred Weber Jr. chooses

for Vigus Quarries Inc., Vigus, St. Louis



1240 PMCO Impact Master with 36" x 12' apron feeder, 30" discharge conveyor, Murphy diesel power. Output fed to vibrating screen over 30" plant conveyor.

TOP QUALITY AGGREGATE IN ONE PASS THROUGH PMCO IMPACT MASTER

Fred Weber Jr. has proof of PMCO Impact Master performance. He's producing 135,000 tons of top quality concrete aggregates to meet CAA and City of St. Louis specifications for airport runways.

Feeding with three trucks, Vigus Quarries Inc. are averaging 175 tph of crushed aggregates. That's 150 tph of specification material with 40% of 2½" down to 1¼", and 60% of 1¼" down to ⅛"; and 25 tph of base rock and aglime. Mr. Weber is enthusiastic about the performance. He says, "We've fed the Impact Master peak loads with additional trucks and we know it has the capacity to turn out 250-260 tph."

Top capacity with greater control over finished product size . . . that's what Controlled Impact Action gives you in the PMCO Impact Master. Its high ratio of reduction eliminates secondary crushers and auxiliary equipment and lets you step into big volume production with minimum plant investment. PMCO Impact Masters have capacities up to 500 tph. Write today for profit-making details on the size that meets your requirements. *Impact Master Division, Universal Engineering Corp., 625 C Avenue N. W., Cedar Rapids, Iowa.*

UNIVERSAL ENGINEERING CORPORATION Division of PETTIBONE MULLIKEN CORPORATION

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A SUPER-BRIGHT RED COVER AIR HOSE

EVEN in the most rugged hose service — direct connection to compressors in mines, quarries and construction operations — you can depend on REDWING-H Cord Air Hose for longest, trouble-free service.

That's because this hose was developed by the G.T.M. — Goodyear Technical Man — to take hard knocks in stride. Everything from its oil-resistant tube to the red cover of tough, resilient stock adds up to long life at lowest over-all cost.

Ask the G.T.M. about REDWING-H Cord Air Hose for your tough jobs. Or see your nearest Goodyear Industrial Rubber Products Distributor. Available in continuous lengths, for working pressures from 200 to 350 lbs. psi maximum; sizes from ½" to 1½" I.D.

GOODYEAR INDUSTRIAL RUBBER PRODUCTS
GTM-Specified
REDWING-H CORD AIR HOSE
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B
C
A — synthetic tube is seamless, nonporous, non flaking, oil-resistant
B — two or three braids of high-strength rayon reinforce against shock blows
C — red cover of heavy, resilient stock bounces away abrasion, cuts, gouges

LOOK FOR YOUR GOODYEAR INDUSTRIAL RUBBER PRODUCTS DISTRIBUTOR *in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods." He handles Hose, Flat Belts, V-Belts, Molded Goods, Packing, Tank Lining, Rubber-Covered Rolls built to the world's highest standard of quality.*

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THE GREATEST NAME IN RUBBER

Redwing—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

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Simplified Conveyor Selection and Erection

. . with STANDARDIZED B G units

Barber-Greene Permanent Conveyors are complete, self-contained, *standardized* units that can be bolted together quickly . . . easily altered and moved. Field assembly of miscellaneous pulleys, bearings, and dozens of other parts is completely eliminated. The *pre-engineered*, factory-assembled terminals operate at top efficiency . . . reduce maintenance expense.

***Prefabrication* reduces manufacturing delays . . . permits our sales engineers to give you prompt quotations. *Standardized* construction and stocking of principal parts mean quicker delivery.**

Chances are, a B-G system offers possibilities you've never before realized. Let us show you how B-G Standardized Conveyors suit your specific needs.

BARBER-GREENE COMPANY
AURORA, ILLINOIS

Her fingertips imagine the taste

The lady doesn't trust her eyes alone.

The buyer of Multiwalls is in much the same position.

Aside from package design, it's hard to tell one manufacturer's bag from another's simply by looking at it or fingering it.

Put the bags out of sight and you may be able to see many differences.

Men who buy 85 per cent of all Multiwalls consider* these intangibles more important than any other factor when they choose their supplier.

Invariably, these are among the first questions they ask . . .

"Is this company big enough?"

"Do they have a fair allocation policy?"

"Are their prices competitive?"

"Do they respect delivery dates?"

In a nutshell—

"Are they good people to do business with?"

We can't tell you what the answers are when these Multiwall users consider Union. This we do know . . . and the inference is yours to make—

In these days of industrial pressure, when *dependability* is a fervent wish as well as a word, men to whom Multiwalls are important are placing an increasing share of their orders with Union.

More so every day . . .

IT'S UNION FOR MULTIWALLS

*August, 1951 research study.

UNION BAG & PAPER CORPORATION • NEW YORK: WOOLWORTH BUILDING • CHICAGO: DAILY NEWS BUILDING

Drill steels do double duty with TIMKEN® interchangeable rock bits!

ONE drill steel can do the work of two when you use Timken® interchangeable rock bits. That's because both Timken multi-use and Timken carbide insert bits fit the same threaded steel. You can change them as the ground changes—right on the job!

For ordinary ground, use Timken multi-use bits. Correctly controlled and reconditioned, they'll give you the lowest cost per foot of hole when full increments of steel can be drilled.

Make a quick switch to Timken carbide insert bits when you hit hard, abrasive ground. They're your best bet for maximum speed drilling, small diameter blast holes, very deep holes and constant gauge holes.

With both of these Timken bits on the job you'll have the answer to every drilling problem.

Both Timken multi-use and Timken carbide insert bits are interchangeable in each thread series. And each type has these three inportant advantages: (1) made from electric furnace Timken fine alloy steel, (2) threads are not subject to drilling impact because of the special shoulder union developed by the Timken Company, (3) quickly and easily changed.

With 20 years of experience in the rock bit field, the Timken Rock Bit Engineering Service is ready to help you choose the best bit for your job. Write The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

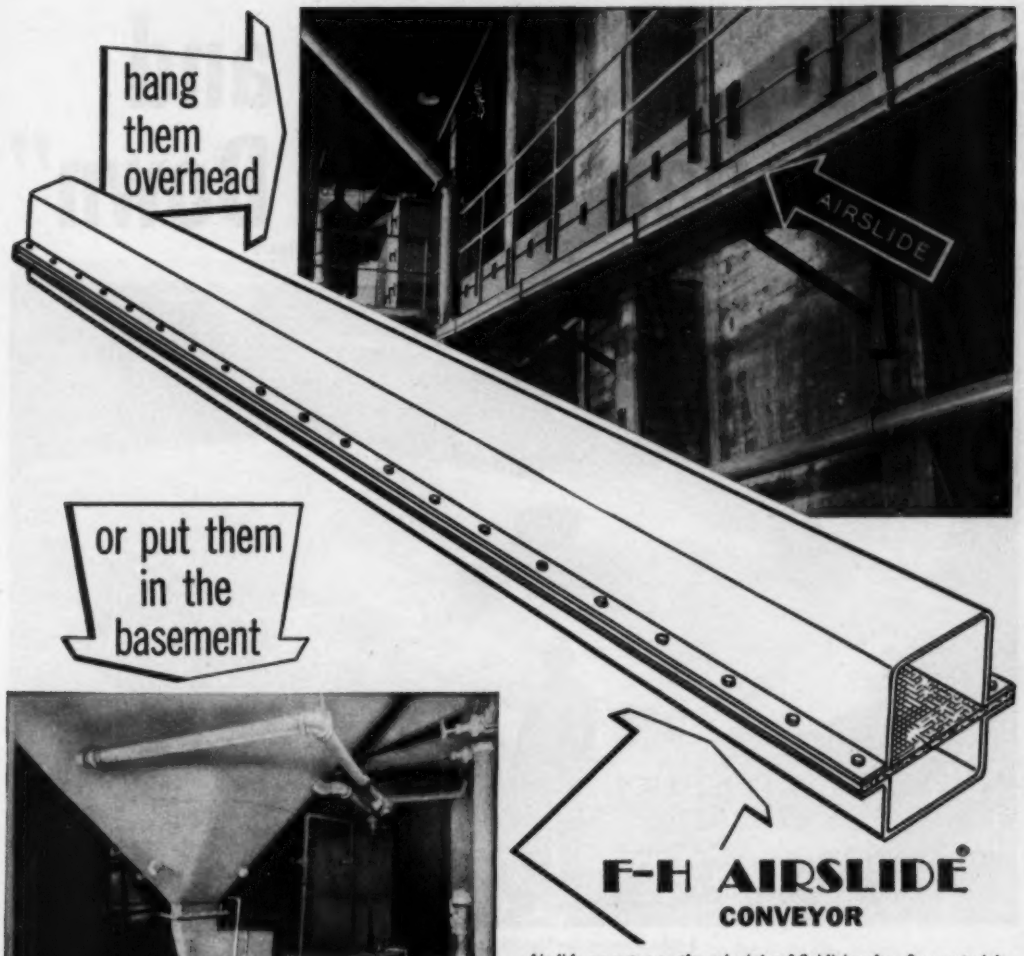
Timken threaded multi-use rock bit

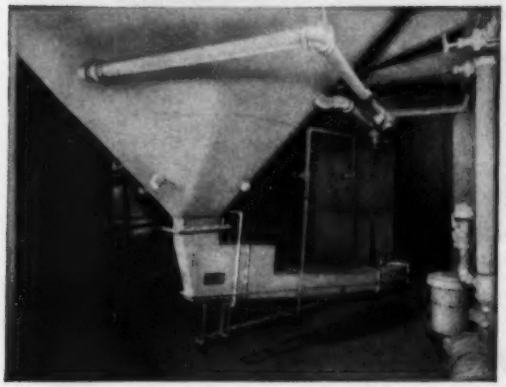
Timken threaded carbide insert rock bit

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

your best bet for the best bit ... for every job





F-H AIRSLIDE® CONVEYOR

Among the many worth-while advantages of the F-H Airslide Conveyor is the ease with which it can be designed and installed to avoid structural obstacles and production equipment; allow for much needed, valuable space in the plant.

Airslides permit economy in location without the restrictions or straight-line limitations of mechanical conveyors. Use of alternate straight and curved sections result in almost complete freedom of location, subject only to headroom requirements to allow for the proper degree of slope required for moving the material. The Airslide operates on the principle of fluidizing dry, fine materials, with low-pressure air, so that they flow by gravity, like water, on a slightly inclined plane.

Photographs shown illustrate two extreme locations. The upper view shows the Airslide, suspended overhead, from a walkway; the other located in a basement.

Airslides will convey materials such as, for example: gypsum, soda ash, fly ash, barytes, bentonite, Portland cement, cement raw material, flour, ground ores, hydrated lime, alumina, catalysts, silica, phosphates, talc, resins, detergents and soap powders, and calcined magnesite.

Why not have a Fuller engineer show you how an F-H Airslide Conveyor system can reduce the cost of conveying dry, fine materials in bulk, while it increases production efficiency. This service costs you nothing and, it may mean a step toward better production, more economically attained.

Fuller

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—
COMPRESSORS AND VACUUM PUMPS—
FEEDERS AND ASSOCIATED EQUIPMENT

FH-28

FULLER COMPANY, Catasauqua, Pa.
Chicago 3—120 S. LaSalle St.
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"Fuller Company is the exclusive manufacturer of air gravity conveyors, except for use in motor vehicles, under Huron Portland Cement Company U.S. Patent Nos. 2,316,814, 2,517,837, 2,527,394, 2,527,455, 2,527,466, 2,527,488 and Patents Pending".

"Motors Cleaner and Repair Costs Down"

say JAMES D. MORRISSEY, Inc., of Philadelphia

Eureka Quarries, Chalfont, Pa. Capacity 4000 tons daily.

Owner of 184 Trucks and 230 Pieces of Equipment Uses Only Sinclair Lubricants

James D. Morrissey, Inc. is one of the largest diversified operators in Pennsylvania.

This company operates the Eureka Quarries, Chalfont, Pa., whose capacity is 4,000 tons daily. It also owns and operates a large asphalt plant and has large construction interests.

Mr. Morrissey, who picks Sinclair Heavy Duty Lubricants for exclusive use in his 184 trucks and 230 pieces of equipment, says:

"Sinclair Heavy Duty Lubricants have proved themselves in two important ways. First, we've saved time and money by being able to standardize our lubricants. Second, we've reduced repair costs due to cleaner motors and lack of sludge accumulation, a problem in some types of our work."

Why don't you learn more about these outstanding heavy-duty lubricants? It will cost you nothing. Contact your nearest Sinclair Representative or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N.Y.

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40 drawbar hp., 11,250 lb.

HD-9
72 drawbar hp., 18,800 lb.

HD-15
109 drawbar hp., 27,850 lb.

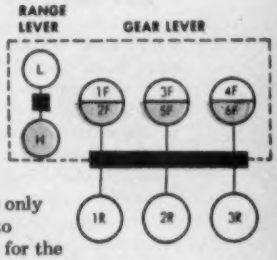
HD-20
Hydraulic Torque Converter Drive, 175 net engine hp., 41,000 lb.

PERCENT MORE PRODUCTION

WITH THE MODERN SHIFT PATTERN ON ALLIS-CHALMERS HD-9 AND HD-15 TRACTORS

It takes just half the time and effort to change from low forward to fast reverse with the Allis-Chalmers HD-9 and HD-15 transmission. This shifting time saved becomes production time gained on bulldozing and other jobs calling for a short forward-backward cycle. For example, job studies prove that on backfilling, pusher work, working around large excavators, digging and loading with front-end shovels—other jobs where frequent shifts are required—you can make five passes in the time usually required to make four...actually increase production up to 25 percent.

Here's how it works



You go from any forward to any reverse speed with one simple shift of the gear lever. The only time you touch the range lever is to select the forward range you want for the job to be done—just set it and forget it.

The constant-mesh Allis-Chalmers transmission makes shifting smooth and effortless...without gear clashing. And it's so easy that the operator can *always* take advantage of high-speed reverse.

This exclusive shift pattern, together with all-steel welded construction, unit assembly, 1,000-hour lubrication, are just a few of the reasons you get more work done with the new *designed-for-your-job* Allis-Chalmers tractors.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

"Bedeviled Copper" helps to build a battleship

● The hard, ductile, malleable metal known as NICKEL derives its name from "kupfer-nickel", meaning *bedeviled copper*, a name given it by superstitious medieval Saxon miners. These miners, in uncovering what appeared to be a fresh lode of silver ore, thought the devil of the earth, *"Old Nick"*, had cast a spell over their ore since it could not be hammered into useful articles . . . *and it was several hundreds of years later that Cronstedt's discovery led to the actual recognition of nickel.*

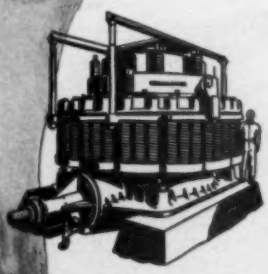
Among the thousands of ways in which nickel now serves man is in the construction of a modern battleship—where this versatile corrosion-resistant metal is used in armor plate, gun tubes and scores of other ordnance, navigational and communications materials.

From the opening of the first Sudbury mine in 1886, the history of nickel is largely that of *International Nickel Company*, who today produce fully 75% of the world's total nickel output. Playing an important role in International Nickel Company's production are twenty *"SYMONS"* Cone Crushers . . . which are recognized throughout the world for their ability to efficiently produce a great quantity of finely crushed product at low cost.

Thus, through the 20 "SYMONS" Cone Crushers at "Inco" mines passes the majority of nickel used today . . . one more example of a job well done by "SYMONS" Cones.

C652

NORDBERG MFG. CO., Milwaukee, Wisconsin



● "SYMONS" Cone Crushers . . . the machines that revolutionized crushing practice . . . are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter . . . capacities from 6 to 900 tons per hour.

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Mine Hoists

"SYMONS" Vibrating Bar Grizzlies and Screens

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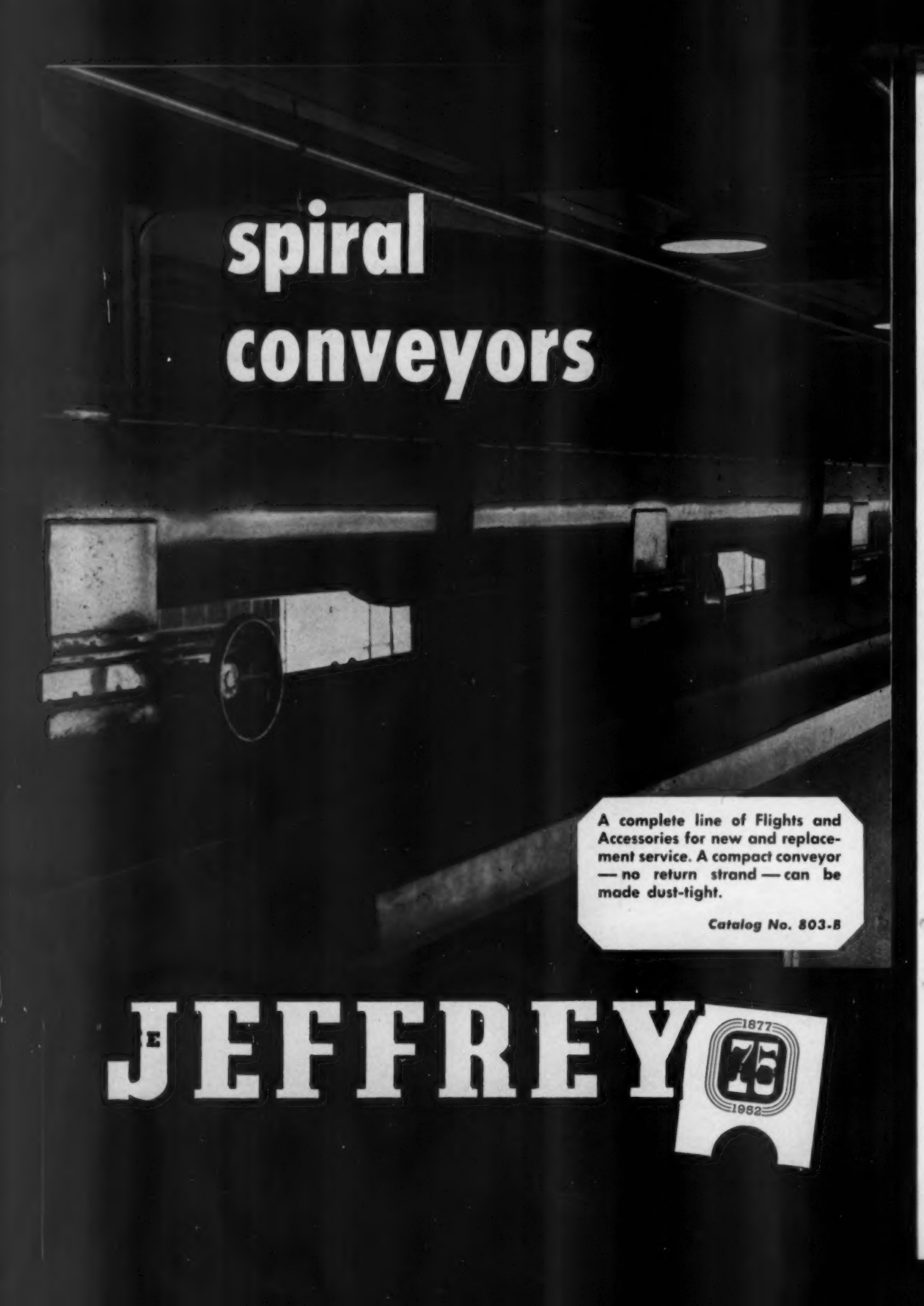
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A complete line of Flights and Accessories for new and replacement service. A compact conveyor — no return strand — can be made dust-tight.
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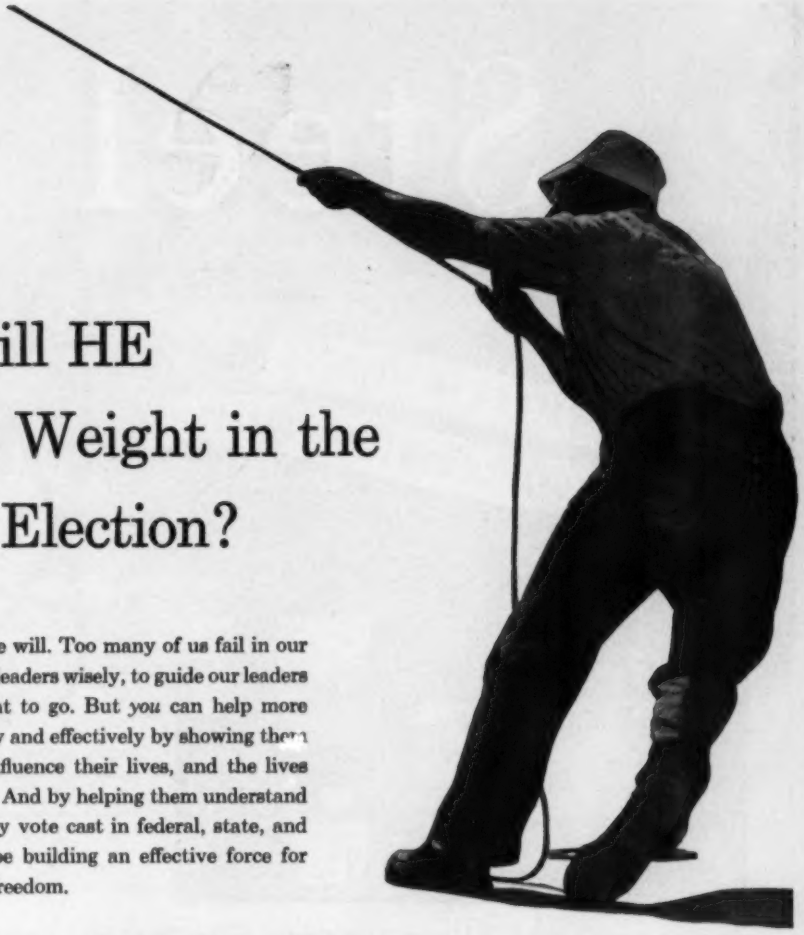
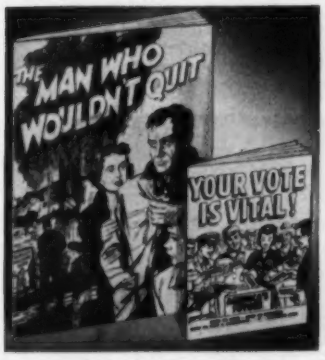


Will HE Pull His Weight in the Next Election?

It is not certain that he will. Too many of us fail in our duty to vote, to choose leaders wisely, to guide our leaders *in the direction* we want to go. But *you* can help more people vote intelligently and effectively by showing them how their votes can influence their lives, and the lives of generations to come. And by helping them understand the importance of every vote cast in federal, state, and local elections, you'll be building an effective force for political and business freedom.

HERE ARE TWO AIDS TO HELP YOUR EMPLOYEES UNDERSTAND WHY THEY SHOULD VOTE AND HOW TO VOTE INTELLIGENTLY



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THIS BOOKLET HAS BEEN TESTED in our own plants by The Psychological Corporation... and *proven effective* in changing people's attitudes. Because good government is everyone's business, Bemis is making "THE MAN WHO WOULDN'T QUIT" available for distribution to your people at nominal cost—$10.00 for 100 copies, down to 3¢ per copy in larger quantities.

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LABORATORY FOR THE ADVANCEMENT OF QUALITY

Another Electric Furnace Increases Sheffield Steel Making Capacity
At both the Houston and Kansas City Sheffield steel mills, ultra modern electric furnaces supplement the many open hearth furnaces in making Sheffield Steel. Also added to Sheffield's steel making facilities is a new and modern laboratory.

Steel enters into every product. Steel is either a part of the product or is used in its production—or both.

Advancement of quality in many products very often must begin in the steel maker's laboratory.

At Sheffield Steel Mills is the most versatile metallurgical laboratory West of the Mississippi and East of the Rockies. It is complete with chemical and physical equipment. Its technical staff continuously searches for improved formulae for a wide diversity of steels and for better processes of heat treatments under automatic pyrometric control.

Then, from raw materials to finished steel, samples are micro and macro etched and photographed for metallurgical observation of porosity, grain structure and faults. The physical laboratory constantly runs impact, fatigue, tensile and hardness tests including stress-strain diagrams.

And, Sheffield's advancement of quality to higher and higher levels goes beyond this. Inspection data is analyzed at every step of manufacture by statistical methods. Thus statistical quality control quickly points out the slightest variation from the high uniform level prescribed.

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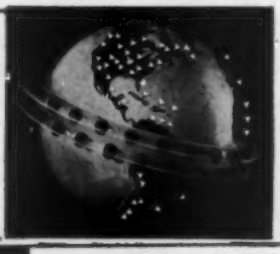
Grinding Balls
USED and PROVED ALL AROUND THE WORLD



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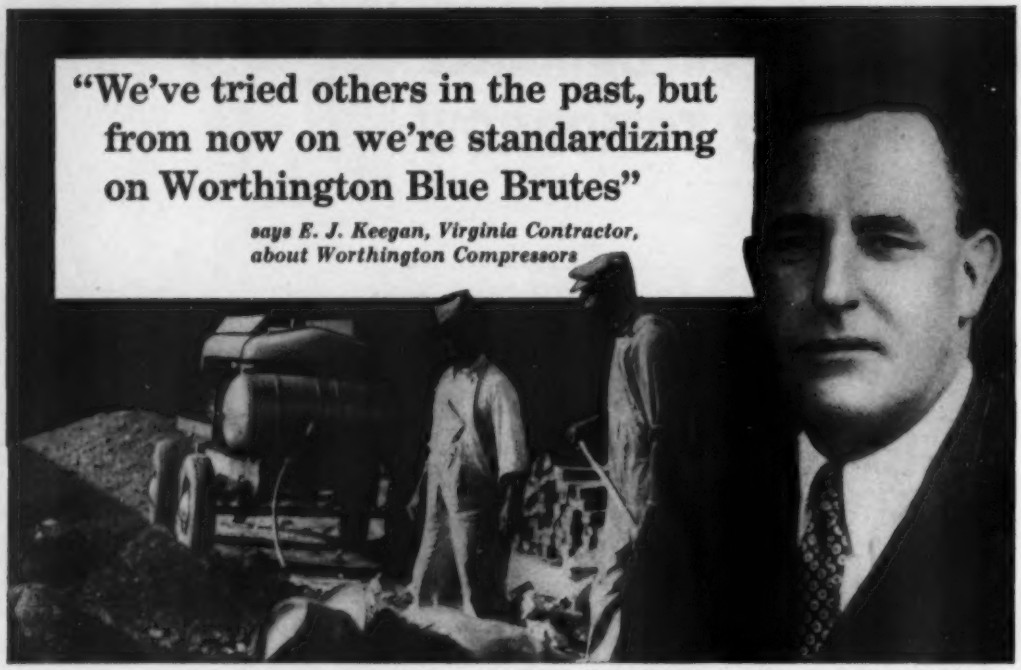
Euclids are engineered and built for long life and dependable performance in off-the-highway service. Their rugged staying power is a major factor in assuring low cost production on a wide range of jobs.

Some of the reasons for the outstanding performance of Euclids are ample power and traction for steep grades and tough roads, fast travel speeds with large capacity payloads, less down time and low maintenance and operating costs.

Whether you are building dams, levees, airports or roads, or moving material in open pit mines, quarries or industrial work, get in touch with your Euclid Distributor. He can show you how to get more loads per hour at more profit per load.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*

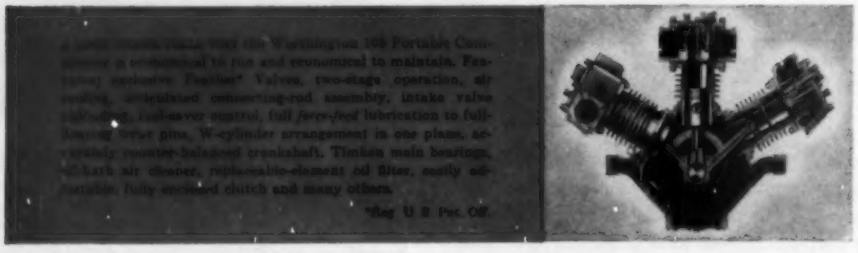

"We've tried others in the past, but from now on we're standardizing on Worthington Blue Brutes"
says E. J. Keegan, Virginia Contractor, about Worthington Compressors

ON THIS MILLION-DOLLAR JOB IN RICHMOND, VA., Hughes-Keegan's air tools are powered by the Worthington Blue Brute 105 Portable Compressor in the background. Job of removing streetcar tracks and ties and widening Richmond's Broad Street was recently completed.

Hughes-Keegan, Inc., Richmond, Va., contractors, have had plenty of opportunity to put compressors through the toughest grinds.

But, E. J. Keegan, president of the well-known firm, tells us they've standardized on Worthington compressors because they've always come through. Hughes-Keegan now has six Blue Brute 105 compressors and a total of 15 Blue Brute air tools.

Blue Brutes may step up efficiency on *your* construction jobs. Write for more facts and bulletins to Worthington Corporation, Construction Equipment Division, Plainfield, New Jersey.



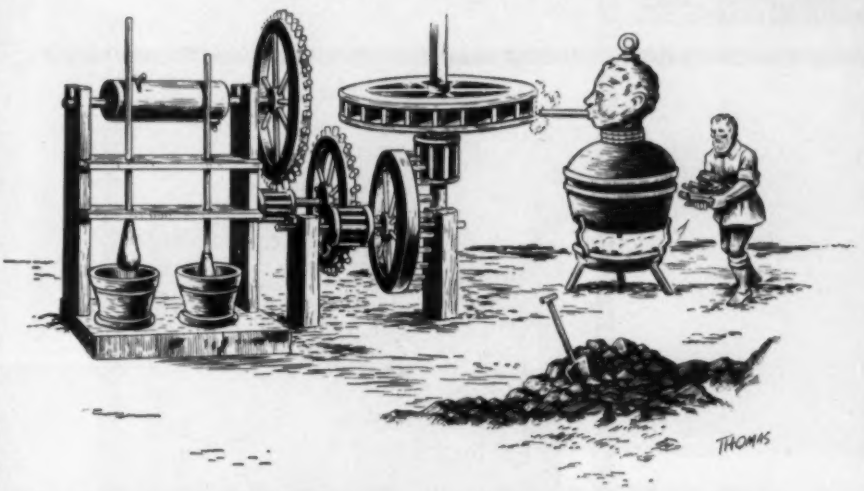
H.2.3

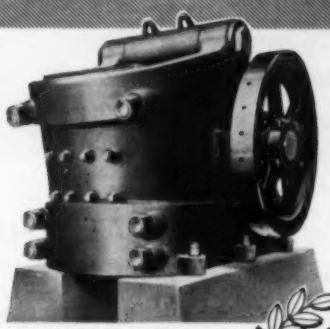
If It's A Construction Job, It's A **Blue Brute** Job

WORTHINGTON
Construction Equipment

This is the first steam turbine . . .

designed for crushing purposes by the engineer Branca in 1629. Crude as it was, it opened new doors to more efficient production.





The Traylor Type B Jaw Crusher, with its scientifically reinforced Meehanite frame and special features, contributes to plant efficiency and lowers the cost of production. Bulletin 1123 gives description.

History shows that by coupling inventiveness with hard work, man has constantly improved the tools he needs to do a better job. For 50 years, Traylor has carried on this tradition by developing new and better rock crushing equipment. In that time, Traylor machinery has gained a world wide reputation for efficiency and dependability on the job. It takes experience to meet the demands of progressive rock crushing methods today. Traylor has experience . . . half a century of it.

OUR GOLDEN ANNIVERSARY YEAR
1902 1952

TRAYLOR ENGINEERING & MANUFACTURING CO.
1416 MILL ST., ALLENTOWN, PA.
SALES OFFICES: New York, Chicago, San Francisco
Canadian Mfr.: Canadian Vickers, Ltd., Montreal, P. Q.

a **Traylor** *leads to greater profits*

SIMPLICITY helps build the Garrison Dam

Two Simplicity Gyrating Screens in operation at the Becker County Sand and Gravel Company in Detroit Lakes, Minnesota, are helping to produce fine aggregate for the Garrison Dam project located 40 miles away. The first Simplicity Screen is a 5' x 12' Double Deck Scalper that works in closed circuit with the crushers. The second is a 5' x 12' Triple Deck Simplicity Screen that feeds minus 3/8" material to the hydraulic classifier and the dewaterer. These Simplicity Screens are doing a splendid job for Becker because Simplicity's famous gyrating action gives them fast, accurate sizing at a low operating cost. For complete information on Simplicity equipment, consult a Simplicity sales engineer or write us today.

111

Sales Representatives in all parts of the U.S.A.
FOR CANADA: Canadian Bridge Engineering Co., Ltd., Walkerville, Ontario
FOR EXPORT: Brown and Sites, 50 Church Street, New York 7, N. Y.

Simplicity
TRADE MARK REGISTERED
ENGINEERING COMPANY • DURAND, MICHIGAN

Kanawha Sand Co., Inc., operates this dredge in the Ohio River between Parkersburg, W. Va., and Marietta, O. All power is supplied by the "Cat" D375 Engine (left) and D397 Electric Set.

Two big "Cat" units team up for production

Dredging sand and gravel from the Ohio River at a rate that runs up to 270 tons an hour is a big operation. To reach such production figures, Kanawha Sand Co., Inc., of Parkersburg, W. Va., uses a pair of "Caterpillar" units—a D375 Engine and a D397 Electric Set—for dual-purpose power.

The D375 drives the dredge with shovel-type cutter head that digs material up from the river bottom. The D397 generates electric power to run the crusher, two vibrators, five conveyors, two washers and the lights and digging controls. Both units are operated on a regular 1,500-hour oil change schedule, and their combined fuel consumption is in the neighborhood of 25 gallons per hour.

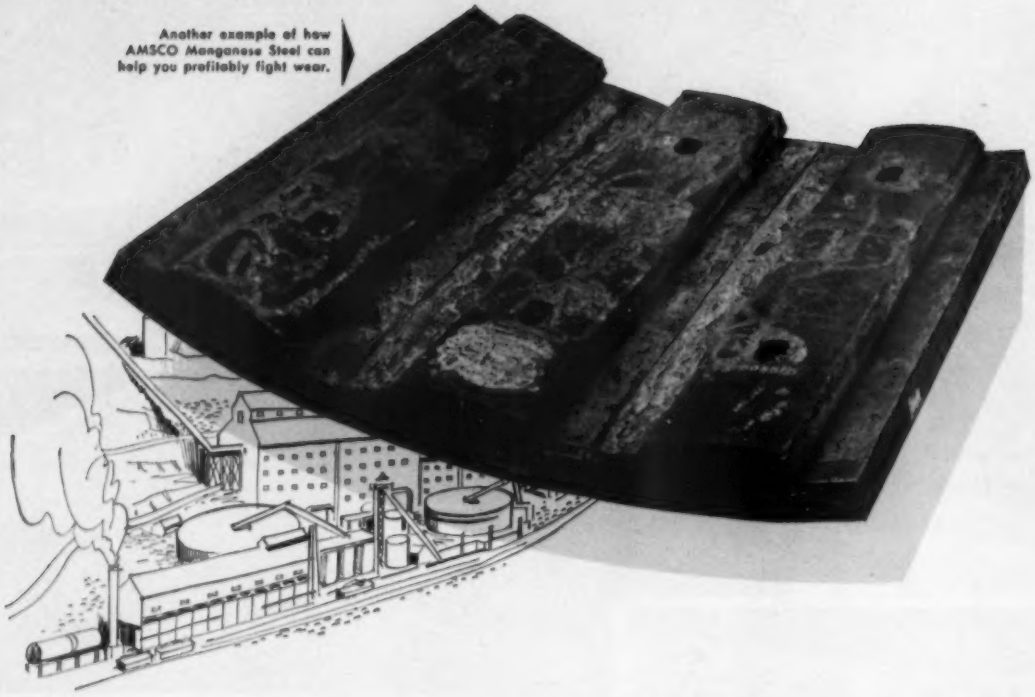
Built with the rugged dependability that has always characterized "Caterpillar" Diesels, the big "Cat" Engines and Electric Sets are now available in 12 sizes up to 500 HP and 314 KW. If you are buying new excavators, compressors or other equipment it will pay you to have the manufacturer install "Caterpillar" power. Or you can replace worn-out units with new "Cat" Engines. Why not talk over your power problem with your "Caterpillar" Dealer? He has facts and figures that should interest you.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT



These LINERS lasted 6 times longer

How AMSCO Manganese Steel increased production . . . lowered costs per ton

A large Western mine had a problem that's all too common . . . Rod Mill Liners that lasted approximately 100,000 tons before an expensive replacement job was necessary.

In July of 1949 something new was tried. This mine installed AMSCO Liners equipped with a specially designed renewable lifter. Result? The AMSCO Liners milled 640,208 tons . . . over 6 times the tonnage of the liners formerly used. There were two important reasons for this tremendous increase in service life:

1. The liners were made of AMSCO Manganese Steel, the toughest steel known for high resistance to abrasion and impact.

2. The overlapping type AMSCO Renewable Lifters took the brunt of the load—reduced the need for replacing the more expensive liners. The lifters alone milled 340,322 tons . . . over 3 times more than the old installation!

WHEREVER YOU MEET A PROBLEM OF WEAR CAUSED BY IMPACT AND/OR ABRASION . . .

. . . find out about longer-lasting, dollar saving Manganese Steel made by AMSCO . . . world's largest producer of Manganese Steel Castings for all industry.

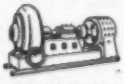
AMSCO controls impact and abrasive wear in 5 basic industrial operations:

Power Transmission

Mining and Excavating

Transportation

Crushing and Pulverizing


Materials Handling

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION

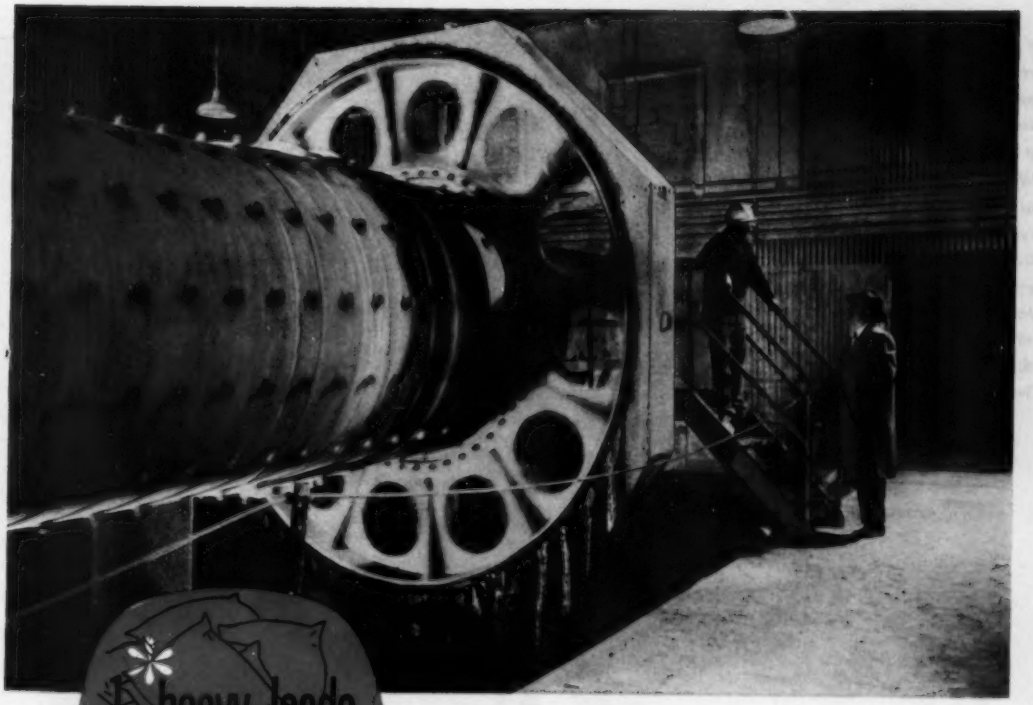
396 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.
Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

Better gear protection

when you need it!

—GULF E. P. LUBRICANTS



With Gulf E.P. Lubricants you get extra protection against gear troubles when production demands put unusually heavy loads on equipment. They are specially compounded to prevent metal-to-metal contact and help protect against pitting, spalling, and excessive wear.

For specific recommendations for your equipment, call in a Gulf Sales Engineer today. Write, wire, or phone your nearest Gulf office.

Gulf Oil Corporation • Gulf Refining Company
Pittsburgh 30, Pa.

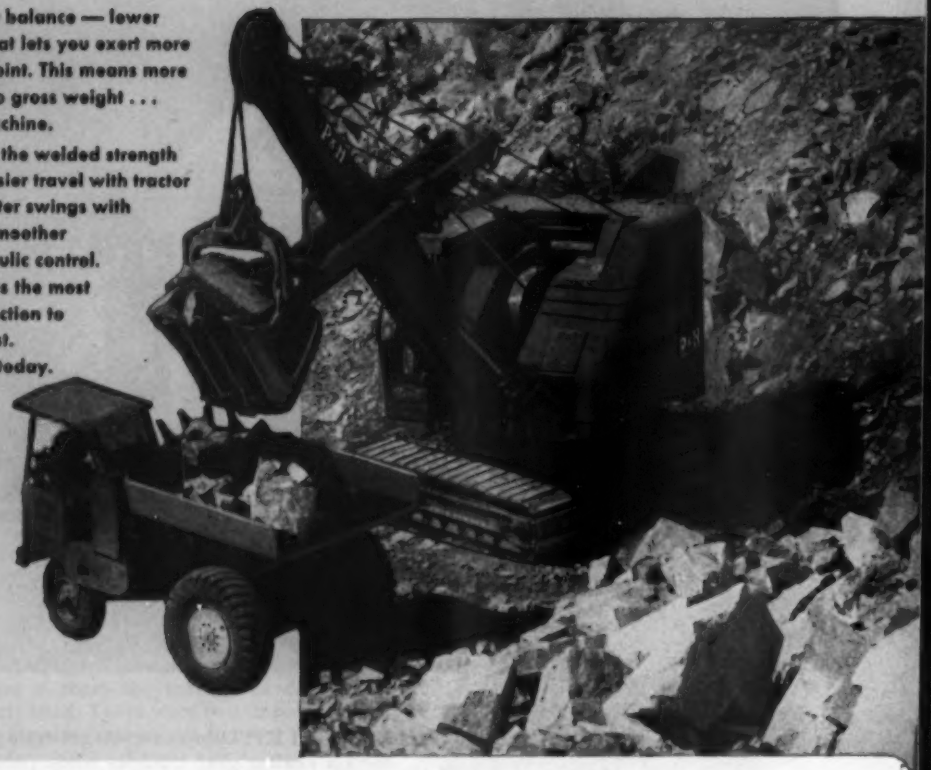
GULF INDUSTRIAL LUBRICATION

P&H STABILITY

GIVES YOU MORE DIGGING POWER

It's a matter of better balance — lower center of gravity—that lets you exert more power at the tooth point. This means more capacity in relation to gross weight . . . a harder working machine.

What's more, there's the welded strength of alloy steels . . . easier travel with tractor type crawlers . . . faster swings with live roller circle . . . smoother operation with hydraulic control. Modern design makes the most of every machine function to dig more at lower cost. See your P&H dealer today.



HARNISCHFEGER CORPORATION

4451 WEST NATIONAL AVENUE • MILWAUKEE 46, WISCONSIN

YOUR P&H DEALER IS READY WITH ALERT SERVICE AND GENUINE P&H PARTS TO KEEP YOUR JOBS ON SCHEDULE.

P&H Power Shovels and Truck Cranes are more easily converted for various types of service because hoist and digging drums are on one shaft. The need for auxiliary shafts and gearing is eliminated. Write for literature on the size you need. Sizes up to 8 cu. yds., gasoline, diesel or electric power.

the P&H Line

SHOVEL · DRAGLINE · BACKFILLER · CRAWLER CRANE · MAGNET CRANE · TRENCH HOE · PILE DRIVER · TRUCK CRANE

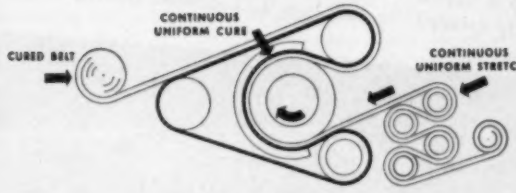
POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PRE-FABRICATED HOMES

Like "Whodunits"?

Many Engineers Have Solved the Mystery of Early Conveyor Belt Failure — They Specify

BWH Rotocured Belts (and prevent OCS*)

DIAGRAMMATIC SKETCH OF EXCLUSIVE ROTOCURE PROCESS



*Overcured Sections — segments 2' to 4' wide present every 30' to 40' in all belts made by the flat press method.

Early failure of many conveyor belts is no "mystery" when you realize the limitations of conventional flat press curing compared to BWH Rotocuring. Flat press belts "carry the seeds of their own destruction" because they are cured by a process of press overlaps which weaken the structure. Each cured section in this process advances less than a full press length, hence segments receive a *double* curing.

BWH ROTOCURED BELTS *cannot* come to you with these weakened sections because they are made by an entirely different process. We call it "ROTOCURE" — you'll call it "a definite cost saver"! Actually it's a process of continuous, endless, constant motion curing. Because there are no press overlaps, there are no weak segments.

Users with the toughest conveying problems who have switched to BWH Rotocured Belts are getting more service and performance for their money in:

1. **Stepped-up belt flex life (up to 40%)**
2. **Elimination of mechanical distortion at the press ends**
3. **Constant, uniform stretch**
4. **Uniform, abrasion-resistant covers**

Your BWH distributor is a specialist who knows how to put these advantages to work on *your* conveying problems . . . ask him *in* — and ask him also about BWH Transmission Belts. (They operate at lower tension and hence last longer).

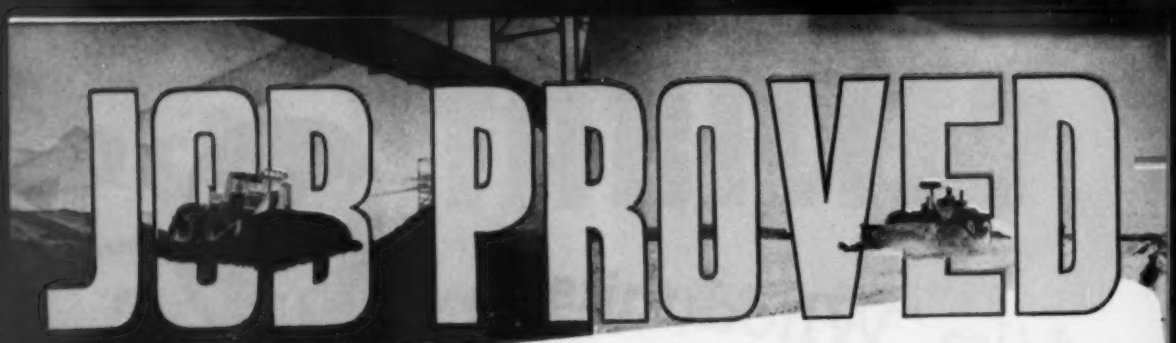
BWH — DEPENDABLE RUGGEDNESS

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Warehouse Stock: 111 N. Canal St., Chicago, Illinois **Distributors in all Principal Cities**

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U. S. A.



JOB PROVED

Always on the alert for new and better methods, progressive dirtmovers everywhere are modernizing their pushing, pulling and dozing tasks with LeTourneau high-speed Tournadozers. Rolling on big rubber tires instead of on steel tracks, Tournadozer provides speed and mobility never before available for your pit operations. Tournadozer goes anywhere under its own power — shovel to shovel, pit to dump, plant to stockpile. It travels fast over any terrain, on pit roads, along or across railroad tracks, or over paved highways. Because it can thus utilize waiting time for productive assignments, one Tournadozer can often replace 2 or more slow-going crawler dozers.

Twice as fast as crawlers

Wherever it goes Tournadozer "runs" at a fast 19 m.p.h. clip instead of "crawling" at 5 to 8 m.p.h. Then, too, your dirtmoving cycle is greatly speeded up by its 8 m.p.h. reverse speed on the return half of the cycle. Instantaneous shift eliminates slowdown or loss of momentum when shifting gears.

Big 21.00 x 25 low-pressure tires give you greater traction and increased flotation in sand, mud, snow or on ice. Tournadozer's 186 h.p. coupled to 4-wheel drive moves heavier loads on the level, up steep grades, or through soft footings.

Tournadozer has many other advanced mechanical features—including fingertip electric steering, shifting, and blade controls . . . constant-mesh transmission . . . multiple-disc air brakes . . . torque converter . . . and down-pressure blade.

No matter where you are located, it will pay you to get all the facts on how modern, rubber-tired Tournadozer can increase your production and reduce costs. For complete information, write or call your LeTourneau Distributor.

In Chile, STOCKPILES NITRATE—At Port of Iquique, Tournadozer speeds bulk storage and simplifies handling of huge quantities of nitrate while working inside and around the outside of two 88,000-ton capacity storage plants. Big-capacity blade easily moves more than 2½ yards of bulk nitrate on each trip from the conveyor, then rehandles it for delivery through hatchways to dock conveyor. High-speed reverse (8 m.p.h.), approximately twice that of most crawlers, is an important time saver on this shuttle-type operation.

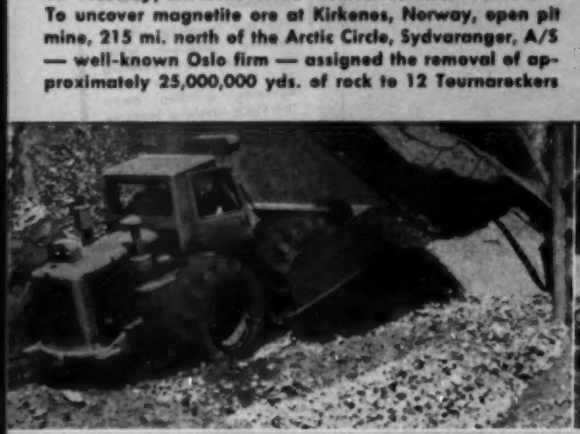
In Mexico, PIONEERS HIGHWAY—For a new super-highway connecting Mexico City and Acapulco, 6 rubber-tired Tournadozers, owned by Constructora Juarez de Mexico, S.A., are speeding initial clearing and pioneering of the rocky 5,500,000-yd. right-of-way. These 19 m.p.h. Tournadozers are removing rock, brush and stumps to smooth the grade ahead of the trucks, shovels and scrapers which are handling final excavation. Big 4-wheel air brakes (2822 sq. in. braking surface) gives operator complete safety on hills.

R. G. LeTOURNEAU, INC.

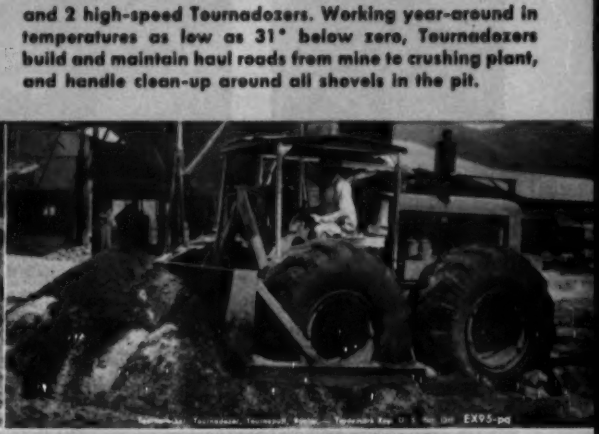
Peoria, Illinois

from Tropics to Arctic Circle

In Norway, MAINTAINS MINE HAUL ROADS— To uncover magnetite ore at Kirkenes, Norway, open pit mine, 215 mi. north of the Arctic Circle, Sydvaranger, A/S — well-known Oslo firm — assigned the removal of approximately 25,000,000 yds. of rock to 12 Tournarockers and 2 high-speed Tournadozers. Working year-around in temperatures as low as 31° below zero, Tournadozers build and maintain haul roads from mine to crushing plant, and handle clean-up around all shovels in the pit.



In Minnesota, HANDLES SCATTERED ODD-JOBS— Stanley Mining Company, Biwabik, Minnesota, operates its ore pit, crusher, and washing plant 24 hours a day, 7 days a week. Mining taconite which must be crushed, screened, and processed — the company found Tournadozer was its best tool for handling scattered dozing jobs. In addition to shovel clean-up, Tournadozer maintains rock dump, cleans spillage at crushing plant, and feeds hopper from surge pile. Rig does work normally handled by 2 to 3 crawlers.

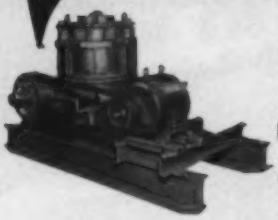


In Venezuela, STOCKPILES SAND AND GRAVEL. — Compania Anonima Caminos uses its Tournadozer for a variety of pushing, pulling and dozing tasks near Puerto La Cruz, Anzoategui. Besides pulling a Bantor and Flatbed trailer, push-loading Tournapulls, and backfilling pipe at the 740-acre refinery, Tournadozer stockpiles sand and gravel for the project's concrete plant. Rig's big blade and 4-wheel 186 h.p. push easily handles heavy materials . . . keeps mixer continuously supplied for uninterrupted operation of company's plant.

WHY CRAWL WHEN YOU CAN RUN?

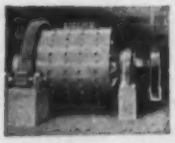
LET

This CRUSHING PLANT DOUBLED CAPACITY...CUT COSTS with a KUE-KEN GYRACONE!



KUE-KEN GYRACONES

A California Crushing Plant was using 30" x 18" rolls which required daily welding to maintain product size. Lost production due to the daily shutdown, coupled with the high cost of the welding itself caused the plant to suffer from unusually high maintenance expense. During a modernization program the plant installed a 3 ft. KUE-KEN Gyracone. *Capacity was increased 100%, with less power requirements!* Furthermore, the plant discovered that the increased percentage of smaller sizes of rock produced by the KUE-KEN allowed them to meet state specifications with ease.



RIB-CONE BALL MILLS

OVERSTROM SCREENS

No wonder more and more operators are turning to

KUE-KEN

FOR BETTER CRUSHING AT LESS COST!

LONGER LIFE *Only* KUE-KEN

has the *"crushing without rubbing"* principle, which means long life to crushing surfaces. Rock is not forced upwards, grinding away the costly crushing faces as in ordinary gyratory crushers. With KUE-KEN the rock is instantly gripped and crushed between the crushing faces with no slipping or rubbing.

SAVE ON INSTALLATION AND FREIGHT — Requires very little headroom: 3 ft. size is only 39" high. Fits easily into flow sheet. Light weight reduces shipping, foundation costs . . . makes installation simpler, cheaper.

Write for factual illustrated data.

KUE-KEN pronounced "QUE-KEN". U.S. and foreign patents pending.

Note extremely low headroom . . . only 39" high. Takes choke feed. Fits easily into flow sheet. Product size is quickly and easily changed.

SEALED LUBRICATION Only KUE-KEN seals the mechanism with a positive lubricated seal, which does not expose oily surfaces to gritty rock dust on every stroke. Oil stays clean, and bearings and gears last longer.

DEALERS: LUND MACHINERY CO., Salt Lake City, Utah; CLOSNER EQUIPMENT CO., San Antonio Texas; WASHINGTON MACHINERY & STORAGE CO., Seattle, Wash.; CONSTRUCTION EQUIPMENT CO., Spokane, Wash.; HEWITT ROBINS, INC., Pasadena, Calif.; EDWARD L. KROPP CO., Portland, Ore.; CAL-ORE MACHINERY CO., Medford, Ore.; ANAHUAC MACHINERY CO., Mexico City, Mexico; UNIVERSAL EQUIPMENT CO., Vancouver, B. C.

541 CHESTNUT ST. • OAKLAND 20, CALIFORNIA

STRAUB MFG. CO.

Kue-Ken Balanced Crushers	Rib Cone Ball Mills	Overflow Classifiers
Kue-Ken Simplex Crushers	Concentrating Tables	Feeders
Kue-Ken Gyratory Crushers	Overhead Eccentric Crushers	Screenwheel Classifiers

Pennsylvania Crusher Co., Exclusive Licensed Eastern Manufacturer and Distributor Broad and Arch Streets, Philadelphia, Pennsylvania.

Sir W. G. Armstrong Whitworth & Co. (Ironfounders) Ltd., Authorized Licensed Manufacturer and Distributor Close Works, Gateshead-upon-Tyne, England.

Practical Assistance

Whether it's a tight squeeze in a cookie jar or a bottleneck in your quarry operation . . . practical assistance—the kind that solves the problem simply and fast—is your best answer. And ***PRACTICAL TECHNICAL ASSISTANCE*** is a *Cities Service specialty.*

Cities Service Lubrication Engineers can offer *practical assistance* that will eliminate bottlenecks caused by faulty lubrication . . . will mean dollars, man-hours and equipment saved. They're specialists in the industry's most effective lubricating practices. In addition, they offer the most complete line of Cities Service quality lubricants.

but check for yourself:

✔ Check on the high quality of all Cities Service lubricants. Ask critical users. Or better still, test them on the job.

✔ Check the complete Cities Service line for the lubricant for every need. Deliveries are quick—and dependable.

✔ And finally, discuss your problems with a Cities Service Lubrication Engineer . . . he's probably solved many like them for other quarry operations. Write or phone CITIES SERVICE OIL COMPANY, Dept. H21, Sixty Wall Tower, New York City 5 . . . or get in touch with the office nearest you.

CITIES SERVICE

WIRE ROPE

This is the most economical rope we've ever made for quarries

ROEBLING is the best known name in wire rope. That's partly because we were the first wire rope maker in America. But more than that, we've always led in developing better wire and better rope for every purpose.

Today's Roebling Preformed "Blue Center" Steel Wire Rope is the quarryman's best choice for efficiency and long life. This rope has *extra* resistance to crushing and abrasion . . . stands up under rough going. It saves you time and cuts costs.

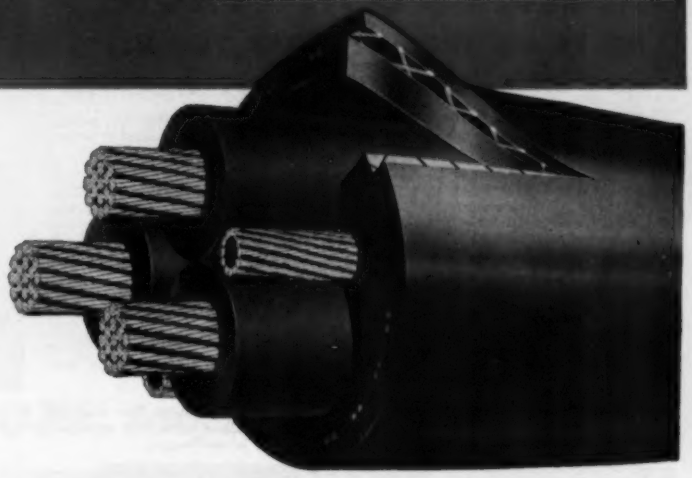
There's a Roebling wire rope of the right specification for top service on any job. Call on your Roebling Field Man for his recommendations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 701 ST. CLAIR AVE., N. E. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1950 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

Here's your mine cable insulated with COLD RUBBER

Another big improvement in Securityflex 600-V Mine Cable



*Cold rubber is firmer and tougher and less permeable. It gives this new and better Type G Securityflex** **much more moisture resistance**
much more compression resistance
much more cut resistance

That means longer cable life, fewer power interruptions, less maintenance trouble, *much more value for your money.*

Also – the famous Anaconda patented rubber-cored grounding wires are non-kinking and cushioned in a larger diameter that won't cut insulation.

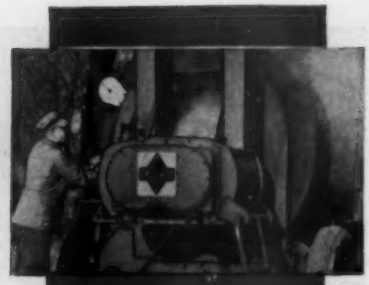
This means far more dependable and efficient grounding. When the cable twists in service the grounding wires are protected. Every wire in every strand is firmly supported and cushioned. There'll be fewer failures, fewer splices, less production loss, less expense.

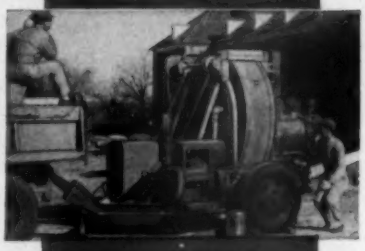
Investigate this cable. See it. Call your nearest Anaconda Sales Office or Anaconda Distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

*Trademark

the right cable for the job ANACONDA® WIRE AND CABLE

Barber-
Mixall
Greene





...THE NEW B-G Mixall

MIXES ALL THE HOT PATCH YOU NEED, ANY TIME, ANYWHERE, ANY WEATHER

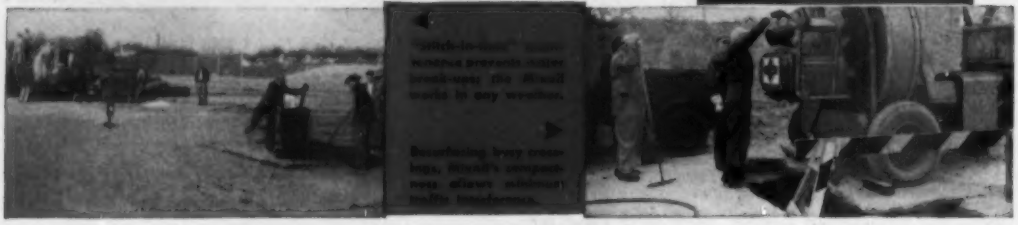
Now, the new Barber-Greene Mixall gives you the opportunity to offer high quality bituminous paving for driveways, sidewalks, service stations, industrial plants, parking lots . . . and other "black top" jobs at new low costs.

The Mixall, a completely new, compact and portable small-job maintenance and paving mixer, will produce up to 5 t.p.h. of any type hot mix . . . up to 10 t.p.h. of cold mix . . . will produce low slump Portland cement mixes. Built to be towed behind the aggregate truck for on-the-spot mixing, the Mixall is just as well suited for central plant or stock pile operation. The Mixall can work in any weather . . . even drying frozen aggregates.

Think of what you could do with the new B-G Mixall in your territory. Then see the Mixall at your first opportunity . . . or write for full information.

THE ONLY SMALL JOB MAINTENANCE MIXER WITH...

- ROTARY DRUM DRYING: The same principle used in largest B-G Continuous Dryers.
- TWIN SHAFT HEATED PUGMILL: "Kneading" action assures even coating of every aggregate particle.
- POWER SKIP HOIST: Only 14" high for easy charging.
- HIGH DISCHARGE: Can discharge directly into place, into wheelbarrows or gas buggies.



SEE YOUR **Barber-Greene** DISTRIBUTOR

BARBER-GREENE COMPANY

AURORA, ILLINOIS

in WIRE ROPE, too, longer life depends on the RIGHT KIND of muscle

Massive, muscular structure gives the elephant the overpowering strength he needs to ward off the attacks of predatory enemies. Even in a hostile environment, these huge animals may stretch out their life span to well over a hundred years.

In wire rope, too, prolonged life is dependent on specialized muscles that will give best resistance to the destructive forces encountered... whether they be abrasion, bending fatigue, load strain or shock stress. That is why in Wickwire Rope we make sure that you get the right grade of steel and size of wire... the right construction and lay of the rope... in short, the right kind of muscle for your particular job.

For full information contact our nearest sales office.

THE COLORADO FUEL AND IRON CORPORATION—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
THE CALIFORNIA WIRE CLOTH CORPORATION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New York • Philadelphia

WICKWIRE ROPE
A CF&I PRODUCT

A YELLOW TRIANGLE ON THE REEL IDENTIFIES WICKWIRE ROPE

WICKWIRE ROPE

CF&I

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

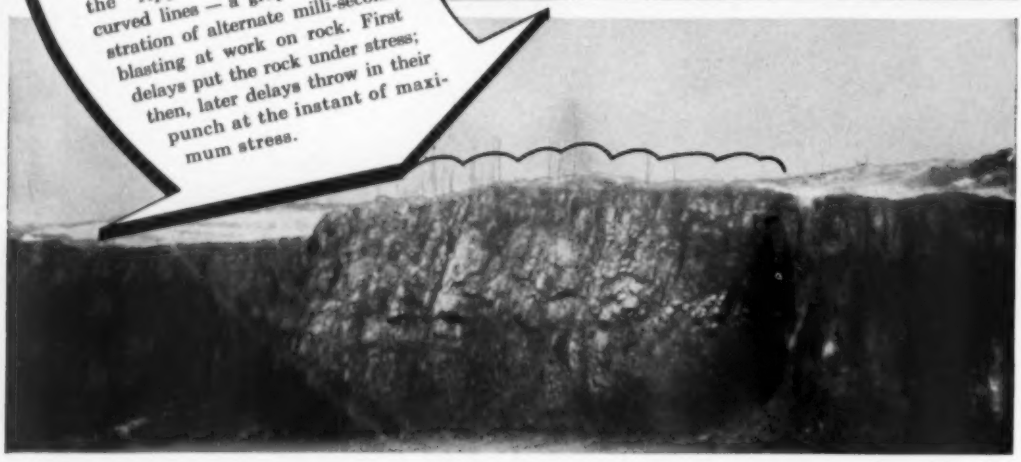
9601

BLASTING CLUES from the ATLAS MACHINE-GUN CAMERA

Ripple reveals key to better breakage with alternate blasting

All ready for a blast at North Jersey Quarry Company's Millington, New Jersey operation. ROCKMASTER® milli-second delay detonators Nos. 2 and 3 are in alternate holes to be fired from the *bottom*.

Here is the peak of the blast. Note the "ripple" indicated by the curved lines — a graphic demonstration of alternate milli-second blasting at work on rock. First delays put the rock under stress; then, later delays throw in their punch at the instant of maximum stress.



And, here is the rock pile ready for the shovel. Rock is practically all "bite-size" and well distributed—visible evidence that with ROCKMASTER milli-second delays blasters can utilize more of the available explosives energy to break rock and pile it to the proper height.

ROCKMASTER Blasting is *controlled* blasting. See how it can work for you. Send for the free 16-page book, *Quarry Blasting the* ROCKMASTER *Way*, illustrating milli-second delay methods with machine-gun photos.

ATLAS EXPLOSIVES

ATLAS

"Everything for Blasting"

ATLAS POWDER COMPANY • WILMINGTON 99, DELAWARE

Offices in principal cities

Scalping-Crushing

COLONIAL Sand and Stone Co., Inc. *uses*

Washing-Sizing

TELSMITH®

TELSMITH Equipment in this Plant

Two 5' x 14' Two-Deck Heavy-Duty Scalping Screens

Two 48-S Gyrasphere Crushers

Eight 4' x 10' One-Deck Vibro-King Dry Screens

Four 4' x 14' Two-Deck Vibro-King Wet Screens

Four 60" x 9' Super Scrubbers

Eight 4' x 10' One-Deck Vibro-King Wet Screens

Two 4' x 12' Two-Deck Pulsator Rinsing Screens

Fourteen Field and Plant Conveyors—18", 24", 36", 42" wide; total length about 3000'

Nineteen 24" x 15' Special Tunnel Gates

G-18-2

● **COLONIAL of NEW YORK CITY and LONG ISLAND own and operate this modern all-steel sand and gravel plant. Designed in close co-operation with Telsmith engineers, plant layout and machinery is of the latest type, properly co-ordinated and balanced for flexibility and capacity, with interlocking features to assure smooth, trouble-free operation.**

Production averages about 1000-1200 tons per hr., making four kinds of material: minus 1½" plus ¼" crushed and uncrushed gravel mixed, minus ¼" plus ⅛" grits, minus ⅛" sand, all washed; and minus ⅛" dry sand. Most of the material is loaded into barges for shipment to New York. A truck-loading plant handles local demands.

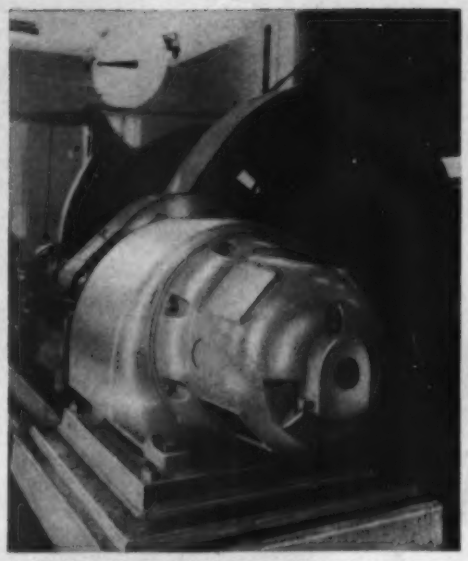
In Scalping-Crushing Unit, two 2-deck Pulsators are in closed circuit with two 48" Gyrasphere Crushers which reduce all gravel to minus 1½". In the Dry Screening Plant eight special Vibro-King Dry Screens produce the dry sand. Scrubbing-Washing-Sizing Unit has two batteries of Vibro-King Wet Screens—two-deckers ahead, with single-deckers following the Super Scrubbers. Get Bulletin 266 describing Telsmith Complete Plant Service.

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

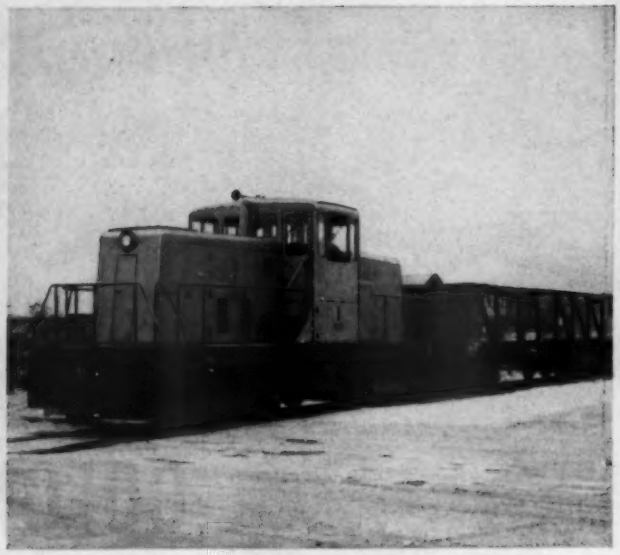
Cable Address: Sengworks, Milwaukee

51 East 42nd St. New York 17 — 211 W. Wacker Dr. Chicago 6, Ill. — 713 Commercial Trust Bldg. Philadelphia 2, Pa. — 238 Main St. Cambridge 42, Mass. — A. N. Wigle Columbus 9, Ohio

Rish Equipment Co. Charleston 22, S.C. & Clarksburg, W.Va. — Rish Equipment Co. Roanoke 7, & Richmond 10, Va. — Interstate Equi. Co. Statesville N.C.



RELIABLE, EFFICIENT HAULAGE is provided by slope hoists such as this one, powered by a G-E wound-rotor induction motor, when rock must move up a steep grade from the quarry floor.



MORE TONS PER HOUR can be moved at lower cost per ton with G-E diesel-electric locomotives like this 65-ton switching unit. Trucks shuttle between quarry face and permanent railroad which runs to primary crushers. Flow of rock is thus maintained.

MOVE MORE ROCK

RUGGED QUARRYING is done by this 3 cu yd electric shovel, powered by G-E MD-600 motors which keep it loading "high-lime" rock to feed primary crusher.

TOUGHEST G-E MOTOR BUILT is the MD-600, made for heavy shovel duty. Hinged top cover permits easy maintenance—right on the shovel—without disturbing motor alignment.

MAXIMUM FLEXIBILITY of power supply is provided by G-E portable, cable-skid switch houses. Advancing with operating equipment, they assure better voltage at quarry face.

Modern rock haulage is one of the six ways to increase your cement plant's output described in a new 12-page illustrated booklet prepared by G.E. A quick guide to electrical modernization opportunities, it offers many ideas on making more cement of controlled quality at lower cost per barrel. Write now for Bulletin GEA-5748.

A CONTINUOUS, HIGH-SPEED FLOW of crushed rock moves along this 30-inch conveyor which is driven by G-E motors. Material from primary crusher is rapidly carried to the cement plant a third of a mile away.

Hazardous rock pile-ups have been eliminated by installing interlocking G-E control to provide for sequenced operation.

AT LESS COST

Electrical modernization of your hoists and shovels, conveyors and haulage, can step up production schedules—boost cement output!

Your plant can increase cement production to new highs when rock is moved efficiently from quarry to primary crusher to mill. Modernization of this first important step in the cement-making process pays big dividends in greater output.

ROCK-HANDLING EFFICIENCY INCREASED!

You can keep raw materials moving on schedule when shovels and conveyors, slope hoists and locomotives are powered by reliable General Electric drives. Close co-operation with builders of materials-handling equipment, plus skilled application engineering, has enabled G.E. to develop efficient, economical drives for every type of material handling service—including yours.

ORDERING SIMPLIFIED—TIME SAVED!

Whatever departments you plan to modernize, your electrical requirements can be handled through G-E project co-ordination. Under this plan, G.E. selects, manufactures and delivers on a carefully co-ordinated basis all the electric equipment you need, whether ordered directly or through your contractors or equipment suppliers. You simplify ordering, save time, forgo unnecessary details.

Insisting on G-E drives pays off in satisfaction and in improved service at lower upkeep cost. Ask your G-E apparatus representative for specific details. *General Electric Company, Schenectady 5, N. Y.* 6284

ENGINEERED ELECTRIC SYSTEMS FOR THE ROCK PRODUCTS INDUSTRY

GENERAL ELECTRIC

EVERY CUBIC YARD IN THIS LOAD MEANS A DOLLAR SAVED for Allen County, Kansas, with an International UD-24 powering the county's portable crushing plant.

Allen County Saves a Dollar a Yard

Read how International helps pile up big savings in limestone quarry

Out in Allen County, Kansas, which boasts 60 limestone quarries, Superintendent of County Roads Roy Maple is saving tax dollars with an economical, International-powered portable crushing plant. Here is his report:

"In our first year of operation, production was over 65,000 cubic yards of crushed limestone at a cost of 40¢ a yard with our plant powered by International's UD-24. We had been paying $1.40 per cubic yard before purchasing our portable plant, so we save a dollar a yard.

"Our UD-24 has given us more than a year and a half of service without any trouble. This crushing plant system has been one of our county's best investments."

Find out how International power can cut costs and boost output in your own operation. Call your International Industrial Distributor or Power Unit Dealer. He has the facts and figures.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

"BEST INVESTMENT," is how Roy Maple (right) feels about his International UD-24.

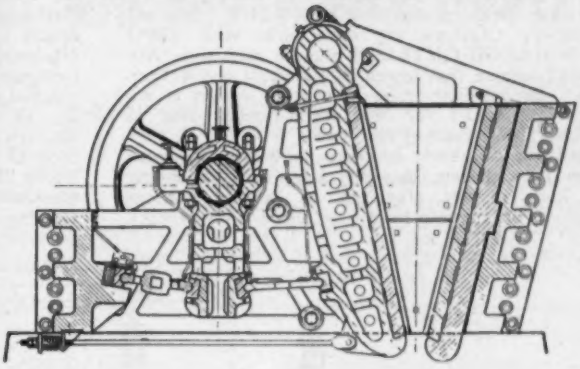
INTERNATIONAL HARVESTER

INTERNATIONAL

POWER THAT PAYS

SWING JAW CRUSHERS

that can "take it" as well as "give it"!



KENNEDY 4-SECTION SPLIT FRAMES OF HERCULITE OR OPEN HEARTH STEEL

KENNEDY Swing Jaw Crushers are built to stand the shock and jar of reducing "Hard-to-crush" sticky rock and ore without strain . . . to go on producing maximum output of rock products without time off for adjustment and repair.

Swing jaws are reversible, end-to-end or side-to-side, for DOUBLE the amount of service obtained from ordinary crushers without this feature. Jaw plates cast in one piece; swing jaw shafts cast integral with swing jaws to eliminate excessive wear encountered in other models.

In use, the World over, these rugged crushers with the stamina of a heavy tank, are built to "Take It" as well as "Give It" and present ever-ready proof that "It Costs Less To Own The Best" when you specify KVS.

CONSIDER THESE EXCLUSIVE FEATURES FOUND ONLY IN KVS SWING JAW CRUSHERS

- Crusher frames built of semi-steel having 50,000 lbs. tensile strength or open hearth steel with tensile strength of 60,000 lbs. per square inch.
- Counterbalanced flywheel for lifting pitman at bottom of stroke. Hoisting engine or jacks not needed to start machine.
- Sectional split frame, bolted in center. Made in either two or four sections to facilitate shipping or placing in mine shaft. Center bolts thrown into tension if strain develops. Superior method of construction to machines joined at corners.
- Built in a wide range of sizes to suit every crushing need.

SEND FOR BULLETIN DESCRIBING ALL TYPES OF KVS CRUSHERS!

IT COSTS LESS TO OWN THE BEST!

Kennedy-Van Saun

MANUFACTURING & ENGINEERING CORPORATION

TWO PARK AVE., NEW YORK 16, N. Y. DANVILLE, PA.

KENNEDY PRESENTS AN INNOVATION IN CRUSHING EQUIPMENT!

NEW

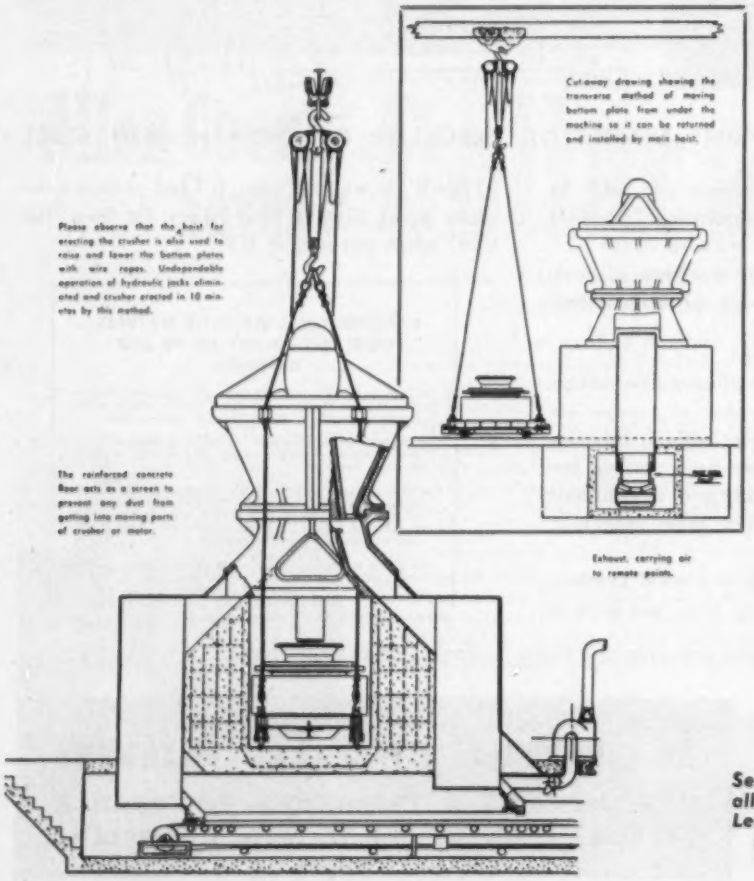
Gyratory Crusher with Dual Discharge Outlets Increases Output and Efficiency

Only KENNEDY has the correct answer to the "Sticky Ore" problem! KENNEDY Gearless Gyratory Crushers are now built with TWO DISCHARGE OUTLETS plus an exclusive "No-Stick" feature that increases efficiency and output. This distinct innovation in crusher design is another "FIRST" for the world-famous line of KENNEDY crushing equipment.

Hard-to-crush rock and ore such as limestone, trap rock, basalt, taconite, slag, etc., containing as high as 50% clay, can be handled without sticking or clogging by the exclusive KVS process.

No other crusher offers this advantage. Double discharge outlets, built at angle of 70 degrees, assure uninterrupted delivery of material. Other crushers, with single 42 degree outlets, cannot compare because the discharge outlet becomes clogged with sticky clay or taconite ore.

In the new KVS crushers, rock and ore pass through mantle and concaves at bottom. A vertical drop of 6 feet then quickly and surely disgorges sticky clay, etc. — greatly speeds production by eliminating clogging — saves countless man hours clearing stalled crushers.


Please observe that the hoist for erecting the crusher is also used to raise and lower the bottom plates with wire ropes. Undependable operation of hydraulic jacks eliminated and crusher erected in 10 minutes by this method.
The reinforced concrete floor acts as a screen to prevent any dust from getting into moving parts of crusher or motor.
Cut-away drawing showing the transverse method of moving bottom plate from under the machine so it can be returned and installed by main hoist.
Exhaust, carrying air to remote points.

CHECK THESE FEATURES!

Synchronous motor built into pulley assembly

Smooth frictionless operation because the crusher is gearless

Power used ONLY for crushing

All moving parts carried on self - aligning roller bearings

KVS forced - feed oiling system pumps four barrels of oil per hour through bearings without waste

Eccentric and ball are spray babbited. NONE has been rebabbited in over three years

Send for bulletins describing all types of KVS crushers. Let us prove that "It Costs Less To Own The Best".

Machinery and Equipment *in use the world over!*

Experience gained in almost a half-century of designing, engineering and manufacturing machinery, used in leading plants the world over, is reflected in the dependability and economy of operation which distinguishes all KVS products. Flow charts and maintenance records compiled in the operation of many different plants equipped with KVS machinery and equipment show an unvarying *decrease* in production costs and a uniform *increase* in output.

The KVS plant at Danville, Pa., provides unrivalled manufacturing facilities. Over 20 acres of floor space under the cranes, equipped with the most modern machinery and engineering facilities in the world, is devoted exclusively to the manufacture of crushing and mining equipment for Lime and Cement plants plus steam generating plants designed to provide maximum power for processing a wide variety of materials and products.

Gyratory crushers (Double Discharge Outlets) Primary & Secondary

Swing Jaw Crushers (Jaws reversible, end-to-end)

Slugger Rolls (Available in single roll models)

Stratified Air Swept Tube Mills

Preheaters, Soaking pits, Deheaters

Rotary kilns, Coolers, Dryers (sectional lengths & diameters)

Rod, Ball & Tube Mills

Vibrating Screens (One, Two or Three decks)

Heavy-Duty Rock Feeders (Kennedy Overlapping Pans)

Disc & Twin Screw Feeders

Apron Feeders & Conveyors

Heavy-duty & Exhaust Fans

Cyclone Collectors

Turbines — Boilers

Waste Heat

Boiler Installations

Pneumatic Transport Pumps

Air Activated Containers

For transporting cement and other pulverized materials by rail, motor truck or within the plant. Send for special bulletin.

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION manufacture everything from a crusher to complete Lime, Cement and Mining Plants and Steam Generating Equipment.

Send for bulletins describing all KVS machinery and equipment. Let us prove "It Costs Less To Own The Best".

IT COSTS LESS.. TO OWN THE BEST!

KENNEDY - VAN SAUN

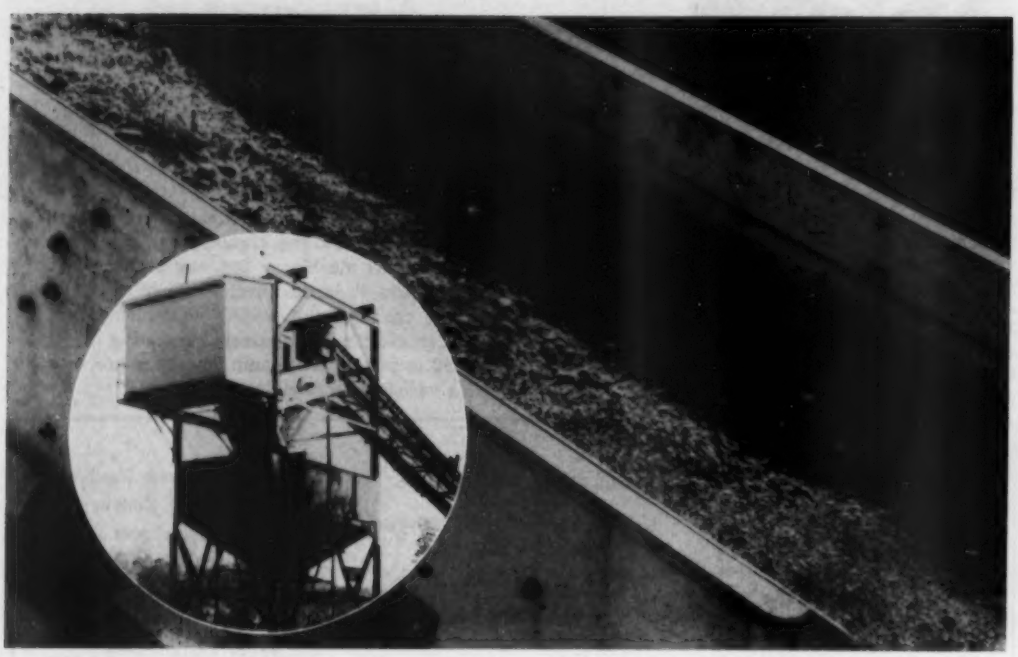
MANUFACTURING & ENGINEERING CORPORATION

TWO PARK AVENUE, NEW YORK

FACTORY DANVILLE, PA.

SECO DRY SCREENS SAND

AT THE DON C. RUSSO PLANT, ROCHESTER, NEW YORK



"BEST MASON SAND YOU EVER DELIVERED" That's What His Customers Say to Mr. Russo

It's a fact! The 4 x 12 type S Seco vibrating screen pictured here with 1/8 slotted opening is taking bank run sand at the Don C. Russo plant, and producing a fine, clean mason sand without any other preparation. Production is at the rate of approximately 45 tons per hour. This piece of equipment is so efficient that virtually no sand is carried over. Here's another on-the-job report that drives home the versatility and dependability of Seco vibrating screens. Back of this and other outstanding screening results of Seco vibrating screens is the patented equalizer assembly. Only Seco has this, and the resultant fully controlled true circular action. Get the whole Seco story. Send for Catalog No. 203.

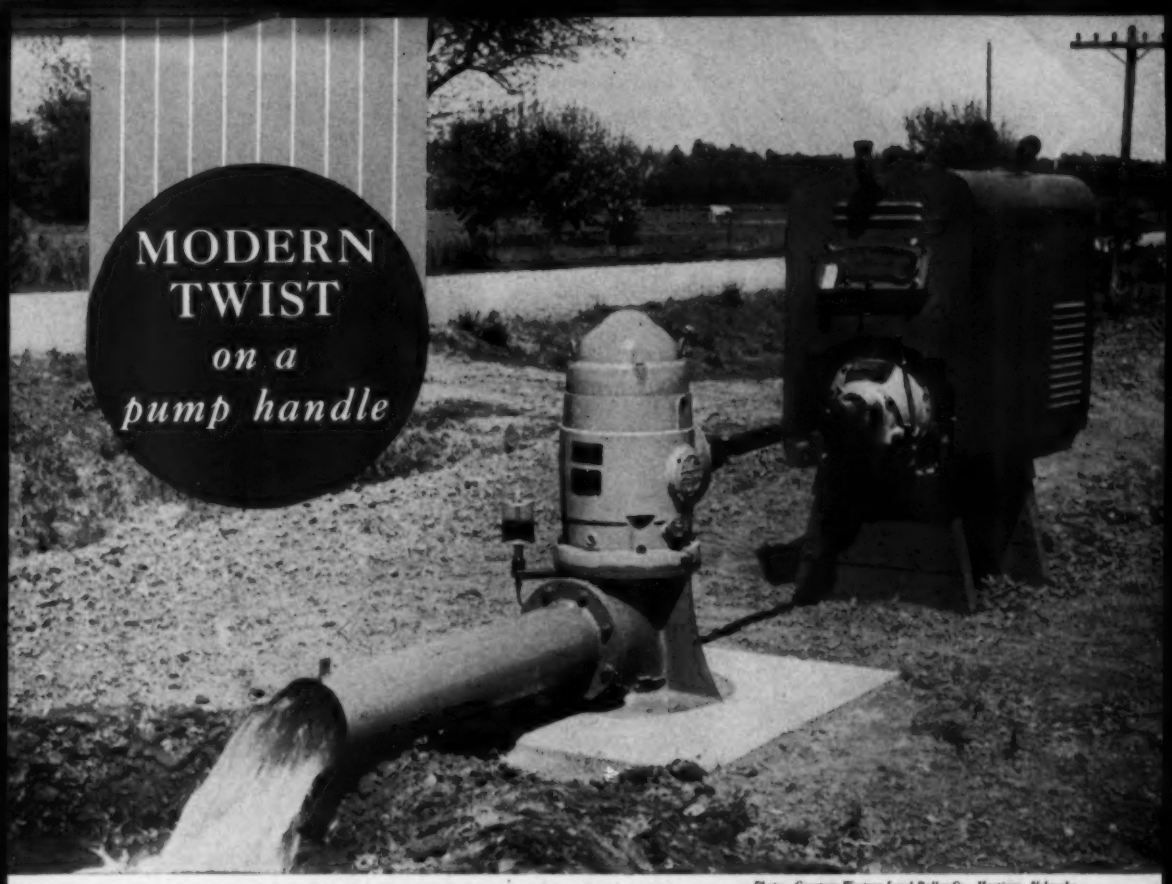
SECO
TRUE CIRCULAR ACTION
VIBRATING SCREENS

LET SECO HELP YOU WITH YOUR DRY SCREENING PROBLEMS.

Whether it's sand, gravel, crushed stone or what, there's just the right Seco model to do the job for you . . . economically, speedily and of course, dependably.

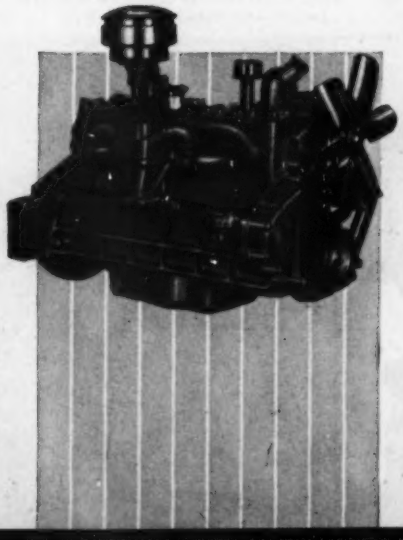
SCREEN EQUIPMENT CO., INC.
1750 Walden Avenue, Buffalo 25, New York

In Canada:
United Steel Corp., Toronto, Ontario, Canada



Photo—Courtesy Western Land Roller Co., Hastings, Nebraska

discharges 1050 gallons of water a minute from 100 feet down!



This 8-inch Deep Well Turbine Pump is furnishing water for irrigation purposes near Hastings, Nebraska. It is powered by a Model 8-A Chrysler Industrial Engine with right angle gear drive.

This is Chrysler high speed and Chrysler high compression doing a specialized job. Other farming, construction, industrial and specialized applications are no exception to this kind of regular performance. Here are a few of the advantages you get in Chrysler Industrial Engines: superfinished wear surfaces, sodium cooled exhaust valves, updraft or downdraft carburetion—and there are many more tailored to the exact needs of your job.

Chrysler Industrial power is not expensive. Production-line methods adapted to specialized industrial engine building, provide a custom-built engine at mass production prices.

See a Chrysler Industrial Engine Dealer. Tell him your power needs. He can supply you with one of 9 Chrysler Industrial Engines for your purposes.

If your problem is special, write us direct: **Marine and Industrial Engine Division, Chrysler Corporation, 12200 E. Jefferson Ave., Detroit 31, Michigan.**

CHRYSLER

Industrial Engines

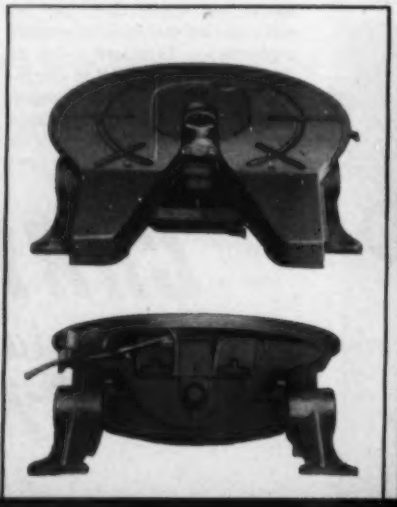
HORSEPOWER WITH A PEDIGREE

Marion shovel, loading a 34-ton coal payload into one of 23 Austin-Western trailers powered by Dart tractors. Scene is at Midland Electric Coal Corporation's strip mine near Farmington, Ill.

ASF Safety 5th Wheels have to be tough to stand up in this heavy-duty service, especially during wet weather when tractors are needed at each end of the semi to get it out of soft ground. Because ASF 5th Wheels are so easy to uncouple, in effect Midland has a *flexible pool* of load-carrying equipment and motive power, rather than 23 separate units. The result is fuller, more efficient use of available equipment.

Back and turn on a dime—In addition to quick interchange between motive power and load-carrying equipment, the tractor-trailer is highly maneuverable. ASF 5th Wheels are side-oscillating: even a full load can be safely and easily jackknifed for a short turning radius.

Heart of the semi—the ASF 5th Wheel—36" extra-heavy-duty ASF Safety 5th Wheel made for the rugged service and heavy loads found in off-highway work. Note the heavily reinforced plate; the massive "I" section center beam; the extra-strong mounting brackets.



He speaks through firsthand experience—M. R. Heckard, Superintendent of Equipment, has used ASF Safety 5th Wheels on all semi's for 11 years. He particularly likes the comparatively new 36" wheel shown at left; feels it will cut maintenance costs to a new low.

The Midland Electric Coal Corporation proves that your best investment for efficient tractor-trailer operation is an ASF Safety 5th Wheel . . .

"Best of all—they're easy to uncouple"

Ease of uncoupling is one of the big reasons why ASF Safety 5th Wheels are standard equipment on the fleet of semi's at Midland Electric Coal Corporation's strip mine near Farmington, Ill. M. R. "Marty" Heckard, Superintendent of Equipment, says:

"We use ASF 5th Wheels on all our semi's, and each wheel takes a real beating during the loading and hauling of a 34-ton payload around 30 times a day.

"One of the main reasons why we like these 5th Wheels is because they are easy to keep free of slack. We just add a shim usually once a year.

"Best of all, however, they are easy to uncouple in a matter of minutes. We can easily shop the tractor for maintenance without the trailer, or vice versa. Working on one at a time makes servicing easier, and we avoid tying up the whole semi."

Quick interchange between motive power and load-carrying equipment is a real asset in mining and quarry work. And there's no denying that you get it with a tractor-trailer. But a 5th wheel—or any hitching device—tends to defeat its purpose if it's hard to uncouple.

Easy uncoupling can save you time, trouble and expense, as it has in this modern strip mine operation. But, it's equally important to know that the ASF Wheel *only uncouples when you want it to uncouple*. This is no beefed-up highway wheel. It's made specially for heavy-duty off-highway service, from the "I" section center beam to the side-oscillating plate that absorbs the sidestrain of uneven roadway. Until a twist of the wrist releases the king-pin, it's built to *stay* coupled—come shocks, strains or high water!

Get the facts on the best 5th wheel investment you can make! See your nearest ASF Distributor, or write: American Steel Foundries, Automotive Division, 410 N. Michigan Avenue, Chicago 11, Ill.

remember this . . . about ASF safety 5th wheels

Largest king-pin bearing area of any 5th wheel . . . Stresses absorbed by a larger bearing area—larger than any other 5th wheel—means longer life for king-pin and jaws.

Shorter king-pin bending leverage . . . Jaws grip the king-pin at the top. The pin *stays straight*—and can't "spring" or disengage.

Side oscillation protects equipment . . . 1½° of free oscillation—plus 5½° controlled by rubber stabilizers—absorbs sidestrain of uneven roadway.

Heavy, cast alloy-steel construction . . . Plate is hinged on strong, rigid "I" beam with big 2" pin. Extra large contact area between plate and beam doubles rocker life. Both rocker and cast-steel bracket are bronze-bushed to cut wear to a minimum.

Easy to maintain in perfect operating condition . . . Wear is inevitable, but on ASF Wheels, it's easily counteracted simply by inserting one or more low-cost shims between buffer and housing front wall. Result? Like-new service, without expensive rebuilding!

A quick glance tells you the lock is LOCKED . . .

LOCKED—as quickly shown by the lever position. The easy-to-see lever can only be in this position when the jaws are truly locked.

UNLOCKING—with an easy twist of the wrist. Simply move the safety dog up, and pull the lever forward.

UNLOCKED—and ready for coupling. The lever moves back to locked position only when the jaws are locked!

A 3,000-pound "compression-grip" saves your maintenance dollars . . .

COUPLING—as the king-pin enters the jaws, the jaws are forced back against the exclusive ASF rubber buffer block, building up compression.

COMPRESSING—3000 pounds are built up before the lock clears the rear jaw, allowing lock to snap to locked position.

LOCKED—and the jaws *remain* under compression. The grip is like a vise; eliminates the slack and backlash that can cost you money in added 5th wheel and king-pin wear.

GM DIESEL CASE HISTORY No. 516-2

USER: Mancini-Miller-Thompsen Co., East Detroit, Michigan

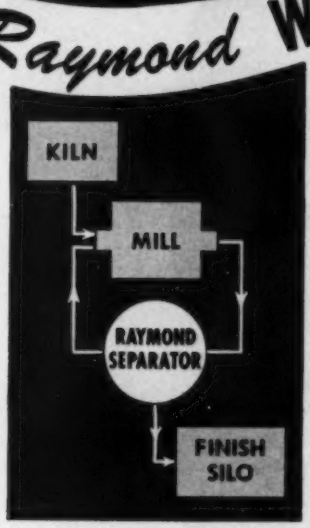
INSTALLATION: GM 6-71 Diesel, powering an Ingersoll-Rand Gyroflow 600 cfm compressor, which supplies air to a McKiernan-Terry 9B3 double-action hammer.

PERFORMANCE: GM Diesel engine in this compressor does the work of two engines powering 500 cfm compressors formerly needed to drive hammer. Fuel costs are halved. GM Diesel saves 15 minutes starting time.

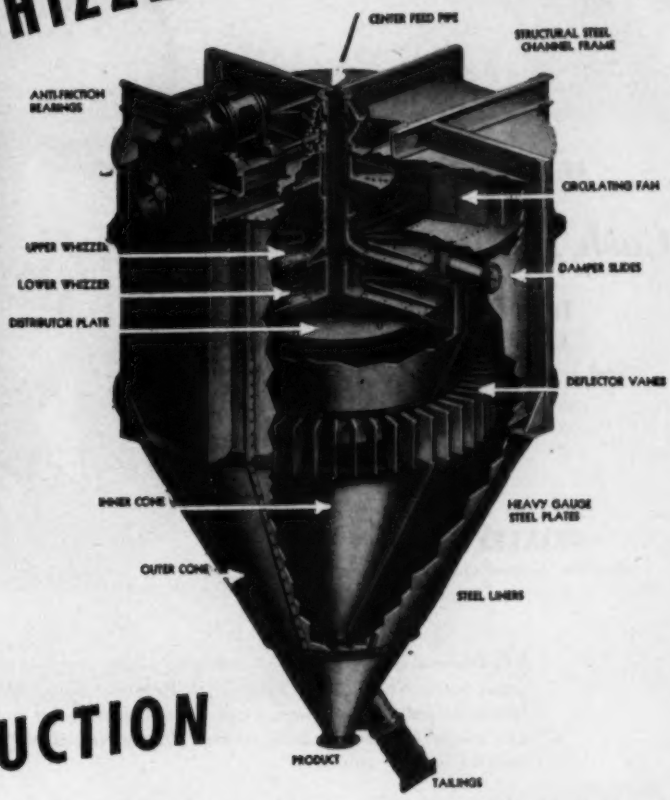
THIS DIESEL TAKES THE PLACE OF TWO

GM
DIESEL
POWER

How Raymond WHIZZER SEPARATION improves CEMENT PRODUCTION



The Raymond Mechanical Air Separator is an important "link" in your cement production line.



Ask for this new Bulletin No. 71, which describes many other uses of Raymond Air Separators.

THE Whizzer principle of classification in Raymond Mechanical Air Separators is an important advantage in closed circuit grinding operations, especially in handling raw mix and cement clinker.

The Double Whizzer Separator in combination with slide damper control gives wide range fineness adjustment . . . from standard Portland to high early strength specifications. Superior results are assured by:—

Closer separation of the fines
Cleaner tailings discharge
Easy control of "surface area"
Greater capacity and uniformity
Overall economy in operation

Specify the Raymond Double Whizzer Separator for improving your cement production and reducing the per-barrel-cost through greatly increased mill output.

COMBUSTION ENGINEERING – SUPERHEATER, INC.

1321 North Branch Street
Chicago 22, Illinois

Raymond PULVERIZER DIVISION

Sales Offices in Principal Cities

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STANLEY C. ALLYN
President, National Cash Register Company

"At National Cash Register we believe a thrifty employee is a better employee and a better citizen. By providing the Payroll Savings Plan for U. S. Defense Bonds we help our employees practice the thrift habit and build up a backlog of savings for their future security. By buying Bonds they become shareholders in their country."

The employee who joins the Payroll Savings Plan becomes *a man with an objective*—a young fellow who realizes that the systematic purchase of Defense Bonds is a sure way to the down payment on a home . . . a father who wants to provide for Junior's college education . . . an older man, with an eye to retirement and personal security.

The man with an objective is a better employee. He knows that a day lost from work is just that much out of his take-home savings. He doesn't take chances—wants to stay off the accident list. He has a new realization that better work on his part will lead to advancement—and a larger monthly allotment for Defense Bonds.

The man with an objective is a better citizen, holds his head a little higher. He is buying a growing share in America . . . helping to combat inflation . . . making a real contribution to the defense effort.

These employee and *employer* benefits of the Payroll Savings Plan are reflected in the records of thousands of companies. Figures show that as employee participation in a Payroll Savings Plan grows to 60%, 70% or higher, absenteeism decreases, the "Lost Time Accidents" curve goes down and production goes up.

If 60% or more of your employees are not Men With Objectives, do something about it. Phone, wire or write to Savings Bond Division, U. S. Treasury Department, Suite 700, Washington Building, Washington, D. C., and your State Director, Treasury Department, will show you how to install a Payroll Savings Plan, or how to build an existing Plan.

During 1951, over 1,500,000 employed men and women joined the Payroll Savings Plan.

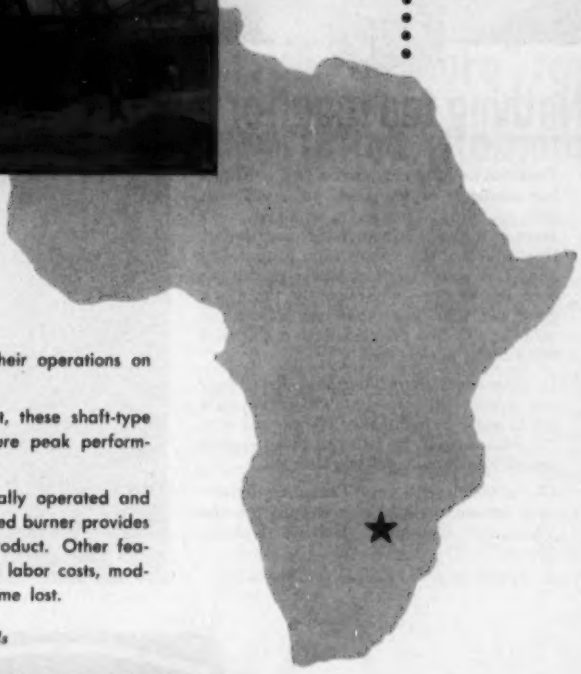
The U.S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

PIT AND QUARRY

PRIEST *Vertical Lime Kilns*

Two PRIEST Vertical Lime Kilns installed for the Rand Water Board, Zuikerbosch Works, Vereeniging, Transvaal, South Africa. Kilns are "producer gas" fired. Capacity: 100 tons per day.

FEATURED IN THIS SOUTH AFRICAN PLANT



Lime producers in many countries base their operations on tested-and-proven PRIEST Lime Kilns.

A highly-successful European development, these shaft-type Kilns present unique advantages that insure peak performance.

PRIEST Lime Kilns are compact, automatically operated and fully mechanized. The patented water-cooled burner provides uniform fuel distribution and a premium product. Other features include dual-fuel firing, low fuel and labor costs, moderate power requirements, and minimum time lost.

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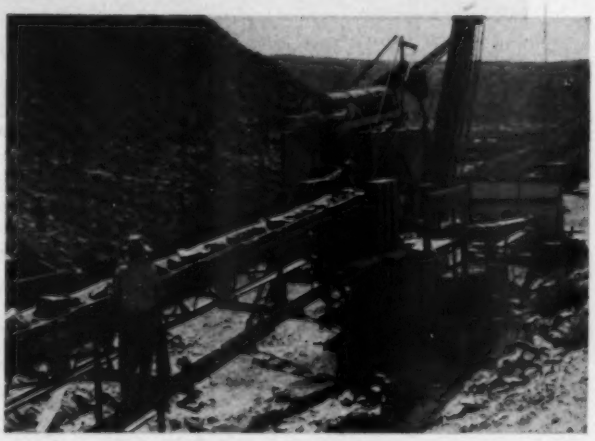
Thermoid's long experience and continuing research *in the field*, pays off with real economy, maximum efficiency and greater tonnage for your belting dollar. Regardless of the size or kind of material—light or heavy, soft or abrasive, hot or cold, wet or dry—whatever the job, it's a good bet that Thermoid has solved the same or a similar problem with a belt that will do the job better.

In most cases, your Thermoid distributor can select the belt that will serve your needs most economically. Where unusual conditions exist, he will call in an experienced Thermoid sales engineer.

Get in touch with your Thermoid distributor or write direct for a copy of the Thermoid Conveyor Belting Catalog No. 3679.

It will pay you to specify Thermoid



Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

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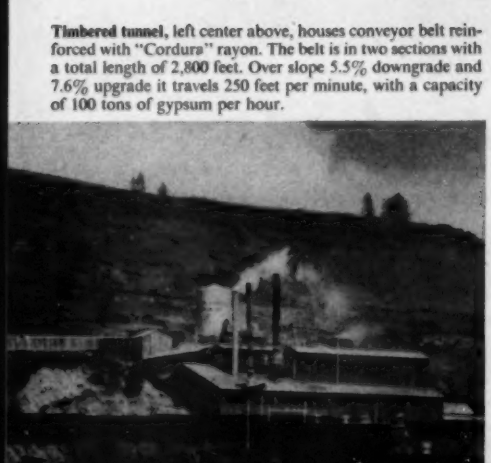
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

At United States Gypsum's plant

Belt reinforced with "Cordura" rayon solves tough transportation problem

Timbered tunnel, left center above, houses conveyor belt reinforced with "Cordura" rayon. The belt is in two sections with a total length of 2,800 feet. Over slope 5.5% downgrade and 7.6% upgrade it travels 250 feet per minute, with a capacity of 100 tons of gypsum per hour.



Whether to go around a hill with railroad track or road, or over it with aerial tramway, or through it with a belt conveyor was the problem faced by the engineers of United States Gypsum's Heath, Montana, plant. They decided on a belt conveyor through the hill as most logical and most economical.

The belt, pictured above, was manufactured by Goodyear Tire & Rubber Company on a carcass of Du Pont Cordura* High Tenacity Rayon.

Now, for a few cents a ton, gypsum is transported from the mine to the mill. The engineers found that belting reinforced with "Cordura" has greater strength and better troughability. That's because man-made "Cordura" rayon yarn is inherently stronger than yarn of natural fibers. It is made of endless strands with no short ends to part under stress. Stretch is reduced to a minimum. "Cordura" thus permits a thinner . . . yet stronger . . . belt, which is naturally more flexible, sits more snugly on the center idler—and therefore trains and troughs better.

Find out about conveyor belts made with "Cordura" rayon. We'll be glad to send you the names of suppliers . . . also give you complete information about "Cordura" in the booklet "Sinews for Industry." For your FREE copy, write: Textile Fibers Dept., Room 4421Q, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

*REG. U.S. PAT. OFF.

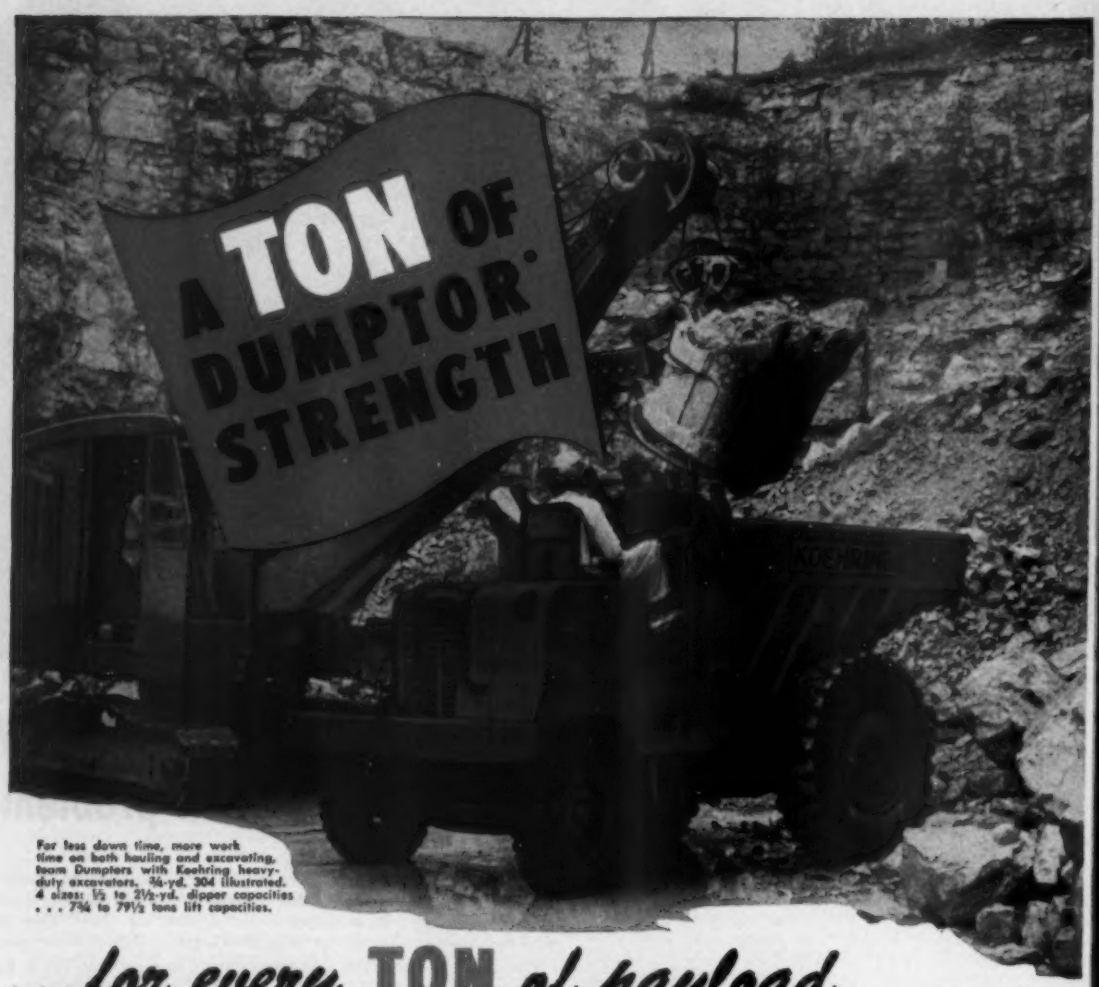
Du Pont "Cordura" High Tenacity Rayon

STRENGTH AT LOW COST

DU PONT

150th Anniversary

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



For less down time, more work time on both hauling and excavating, team Dumptors with Koehring heavy-duty excavators. ¾-yd. 304 illustrated. 4 sizes: ½ to 2½-yd. dipper capacities . . . 7¾ to 79½ tons lift capacities.

. . . for every TON of payload

Dumptors stand up under the severest shocks of shovel-loading 1½ to 2½ yards of rock at a pass because they're built extra tough for rock handling. There's more than a ton of net vehicle weight for every ton of payload.

All-welded body, sides, ends and bottom are heavily reinforced with 4" channel ribs. More than triple strength has been built into the bottom . . . seasoned 1⅝" oak timbers are securely bolted between two layers of 5/16" steel plate. Steel-oak-steel construction cushions shocks of rock loading. Free-swinging, kick-out pan adds another tough 3/16" high-manganese steel plate for extra protection. Dumptor also has: rugged main frame, 8" ship-channels, heavily trussed . . . one-piece steel drive-axle housing and transmission case . . . 4" chrome steel drive axles . . . cast alloy steel "I" beam steering axle. All add extra strength to Dumptor chassis.

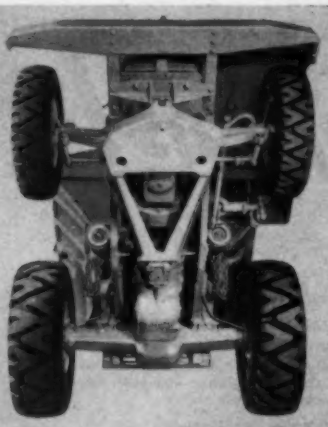
Heavy-duty construction like this assures you that Koehring 6-yard Dumptors will stand up under your toughest assignments . . . that there will be little down time with Dumptors on your job. For complete facts, see your Koehring distributor today.

CX122

KOEHRING HEAVY DUTY

KOEHRING DUMPTOR

KOEHRING COMPANY, MILWAUKEE 16, WIS. • SUBSIDIARIES: • KWIK-MIX • PARSONS • JOHNSON



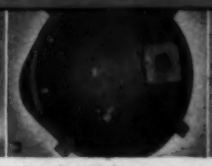
NO "SOFT SPOT" on Dumpter's underside . . . 1-piece, cast steel housing protects drive axle and enclosed chain drive. Wishbone supports the skid plate . . . shields the radius rod and the engine crank case . . . and supports the oscillating steering axle.

KICK-OUT PAN adds an extra 3/16" high-manganese steel plate on top of sturdy Dumpter bottom . . . breaks suction of sticky materials for fast, clean dump. Big 8' x 8' top gives easy-to-hit target for fast loading over the side or end . . . with less spillage.

1-SECOND GRAVITY DUMP . . . no slow-acting body hoists . . . no body-hoist maintenance . . . plus same speeds forward and reverse for no-turn shuttle hauling keep production yardage high, costs low with Dumpters.

INCREASE BATCH PLANT PROFITS *with Johnson accessories*

Rotary Vane Compressor gives 7 cu. ft. air pressure per min. cement aeration. 15-lb.-limit relief valve.

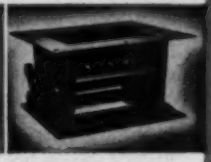


Aeration Fittings properly spaced in Johnson bins and silos keep cement free flowing.

3-Way Elevator Discharge Valve, a flop-type chute, directs flow of cement to the storage tank.

Pivoted Distributor feeds aggregates to bin sections. Positions and locks by ground control wheel.

Bin Signals accurately register high and low levels in cement or aggregate. Dust-proof.



Rotary Plug Valve accurately controls cement flow. Plug operates freely in self-aligning bearings.

Receiving Hopper 30 and 50-bbl. sizes, feeds bulk cement to elevator. All-welded, weather-proof.

Aggregate Fill Valves single clam, radial type for jam-proof closing. Hydraulic pressure lubrication.

Tunnel Gate for stockpile reclamation. Single radial clam. Skirt board is hinged, opens and locks securely.

Safety Cage of 28" steel, welded to casing, can be furnished with all Johnson elevators.

Water Weigh Batchers, semi- or full-automatic types. 120 and 240-gal. sizes available.

Elevator Buckets in many sizes for aggregates, and cement. **Steel Chain** has carburized knuckles.

Batcher Test Weights in sets of nine, 50-lb. calibrated units, and two 25-lb. steel hangers.

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CHAMPAIGN, ILLINOIS
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Walks away with tough payloads!

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That means you can expect consistently high performance and longer truck life, plus greater comfort and easier handling.

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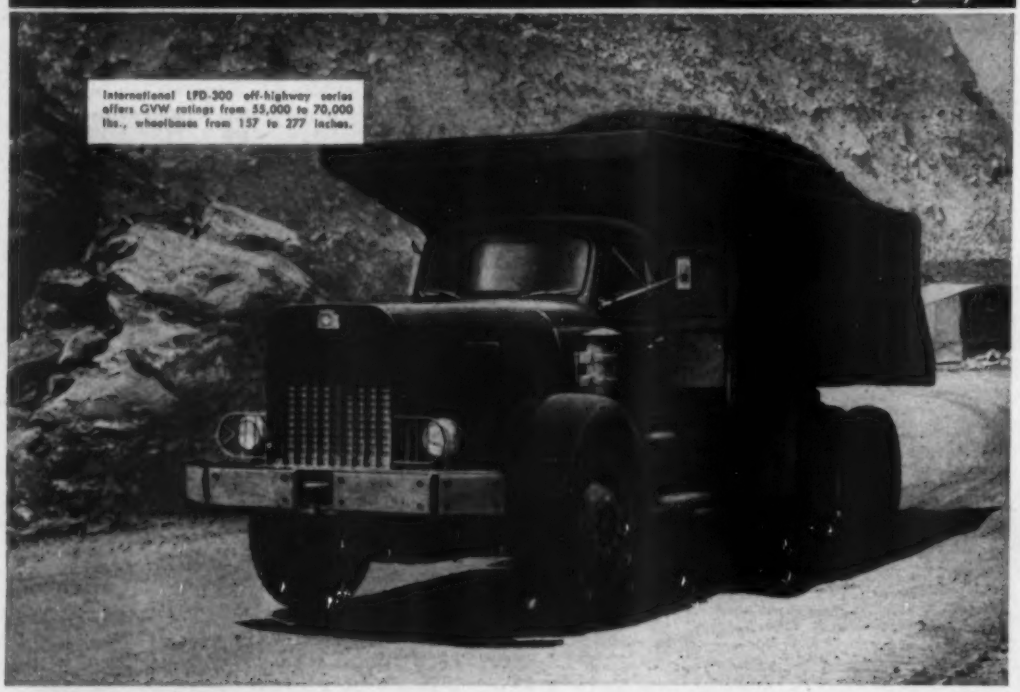
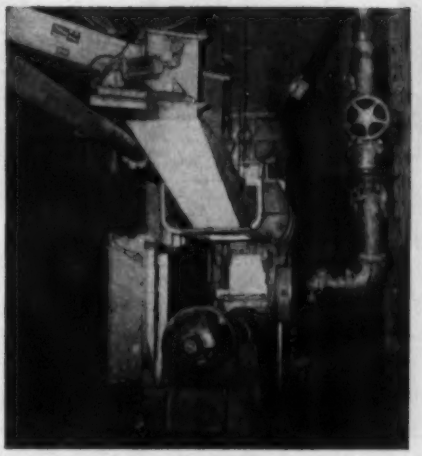
Better roads mean a better America

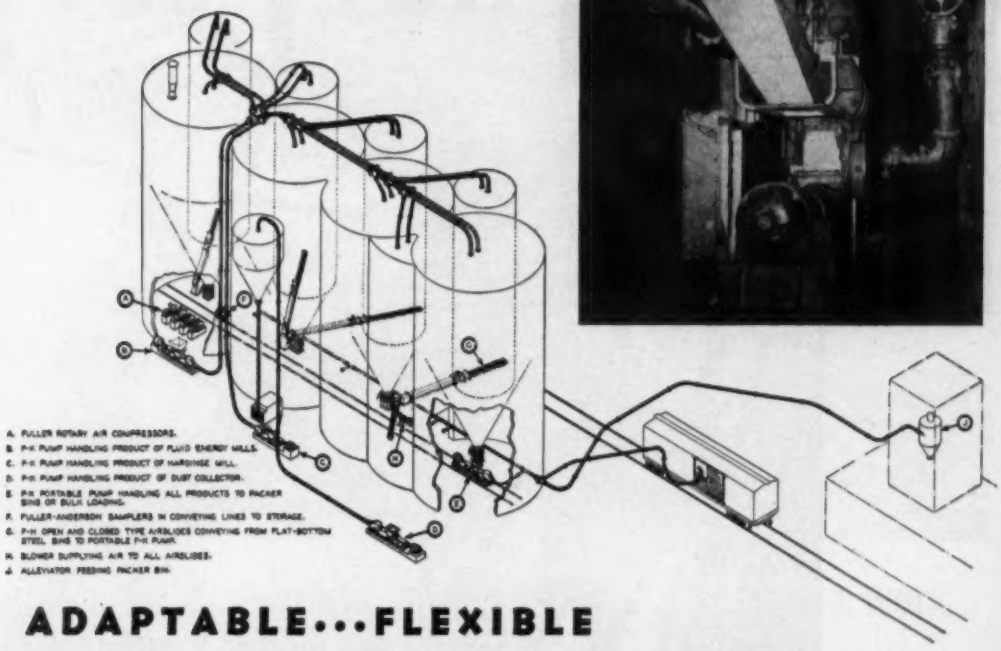
INTERNATIONAL TRUCKS

"Standard of the Highway"



Fuller-Kinyon Portable Pump underneath silos. F-H Airslide (upper left) from flat-bottom bin, for delivery to pump.




A. FULLER ROTARY AIR COMPRESSORS.
B. F-K PUMP HANDLING PRODUCT OF FLUID ENERGY MILLS.
C. F-K PUMP HANDLING PRODUCT OF HARDINGE MILL.
D. F-K PUMP HANDLING PRODUCT OF DUST COLLECTOR.
E. F-K PORTABLE PUMP HANDLING ALL PRODUCTS TO PACKER BINS OR BULK LOADING.
F. FULLER-ANDERSON SAMPLERS IN CONVEYING LINES TO STORAGE.
G. F-H OPEN AND CLOSED TYPE AIRSLIDES CONVEYING FROM FLAT-BOTTOM STEEL BINS TO PORTABLE F-K PUMP.
H. BLOWER SUPPLYING AIR TO ALL AIRSLIDES.
J. ALLEVIATOR FEEDING PACKER BIN.

ADAPTABLE...FLEXIBLE

FULLER-KINYON CONVEYING SYSTEM and F-H AIRSLIDE

Conveying of dry pulverized materials in bulk, by air, is the efficient, economical, modern way. Materials such as talc, clays, Portland cement, pulverized coal, fly ash, limestone dust, Fuller's earth, catalysts, can be handled.

Adaptability and flexibility are important features of the Fuller-Kinyon and Airslide Systems. The plant illustrated originally comprised four concrete storage silos, served by a Fuller-Kinyon Portable Pump, operated on a track underneath the silos, for conveying talc to packer bin and bulk-car loading. Later, storage was increased by the addition of five flat-bottom steel bins adjacent to the concrete silos. For economical conveying from these bins, F-H Airslides were installed, to convey to the F-K Portable Pump. Later, for more advantageous packing and loading, the packer bin was moved to a new location. These additions and changes required no major alteration to the Fuller-Kinyon system, merely the extending of the conveying pipe line to the new packing plant location.

Pneumatic conveying systems can be installed without interfering with existing structures or equipment, without interrupting production. May we suggest that you have us make a study of your conveying problems. Our findings and recommendations may give you an entirely new concept of conveying.

Fuller Company is the exclusive manufacturer of air gravity conveyors, except for use in motor vehicles, under Huron Portland Cement Company U. S. Patent Nos. 2,316,814, 2,517,837, 2,527,394, 2,527,455, 2,527,466, 2,527,488 and Patents Pending.

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DRY MATERIAL CONVEYING SYSTEMS AND COOLERS • COMPRESSORS AND VACUUM PUMPS FEEDERS AND ASSOCIATED EQUIPMENT

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FOR STONE PLANT OPERATORS

FOR SAND AND GRAVEL MEN

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CHAMPION AIR HOSE

more capable power carriers speed excavation work

You're familiar with the situation pictured above. Loose earth shoveled away while shot hole drilling proceeds. Then the blast. Then more shoveling, more drilling until the entire excavation is completed.

But do you realize that this entire operation depends upon one item?

Republic Rubber Champion Air Hose delivers the power that moves the air drill that feeds the shovel. One breakdown and the whole business grinds to a halt.

On jobs like this, you profit by using the very best air hose available. That's Republic's Champion, a tough, yellow-covered work horse especially made for outdoor service. Easy to handle, easy to see, safe to use, Champion Air Hose is available through your local Republic Rubber Distributor in all standard sizes in lengths up to and including 50 feet.

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And see your Republic Distributor for a cost-saving analysis before you buy any product of industrial rubber. Remember, if it's made of rubber, Republic builds it better!!

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YOUNGSTOWN, OHIO

VOL. 45 AUGUST 1952 No. 2

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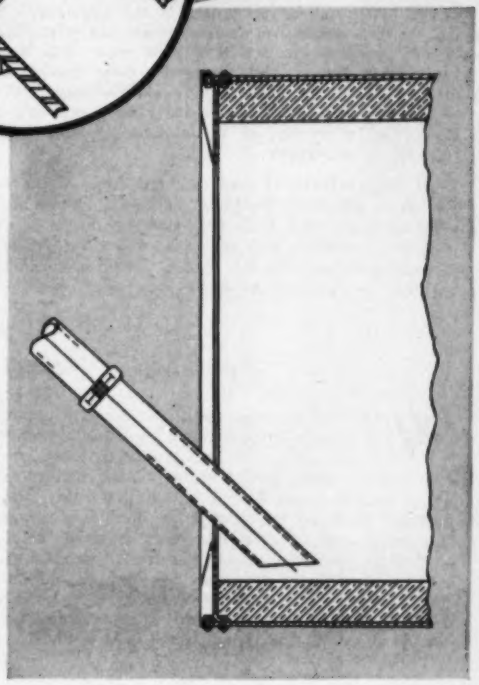
* an added money-saving feature



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BOILER DIVISION

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PIT AND QUARRY

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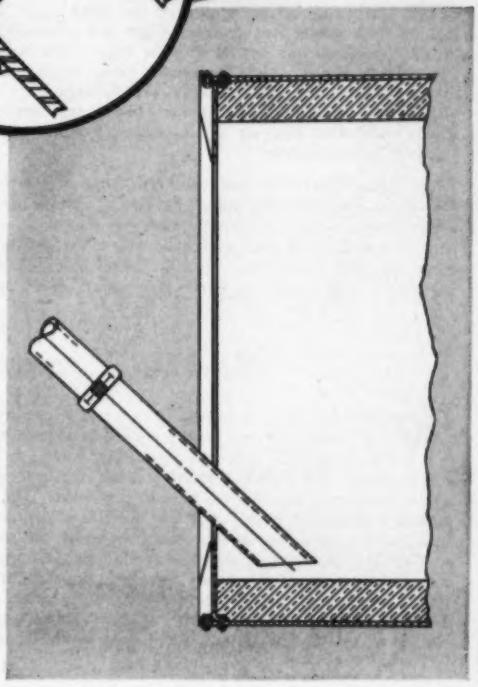

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S-412

editorial

Industrial Noise Control

IT has long been recognized that excessive industrial noise is injurious to workers' health, comfort, and safety and that reduction of noise is good business in that it improves the workers' efficiency. Many factories and offices have done everything possible to reduce noise through the use of quieter machinery, sound-absorbing materials on floors, walls, and ceilings, etc. Remarkable results have been obtained along these lines in many industries, and in some of them the lack of noise seems almost oppressive to one not used to it. In many places soft "canned" music has been provided, also with beneficial effects.

The almost total elimination of noise is, of course, possible only in certain types of industries, but most others can reduce the noise considerably by taking proper steps. Several speakers at the recent Midwest Safety Conference threw considerable light on this subject. Dr. George Shambaugh Jr., of the Northwestern University Medical School, said that "the popular idea that noise injures the ear drum is false. High noise levels of more than 100 decibels can cause a tickling, or even pain, in the ear from the violent movement of the drum membrane, but permanent damage to this part of the ear does not occur from industrial noise.

"The part of the ear injured by noise," said Dr. Shambaugh, "is the nerve mechanism of the inner ear." This has its own protective devices which are effective for ordinary noises, but which cannot cope with sudden explosive noises or high industrial noise levels. Such noise exposure, he said, usually causes temporary loss of hearing for a few hours or days, but if exposure continues day after day, or if the noise is loud enough, recovery is incomplete.

DR. SHAMBAUGH said that reduction of the noise at its source is the ideal method of prevention of noise deafness and that reduction of the noise level even a few decibels may make the difference between a dangerous and a safe level. Various means of accomplishing this result were suggested. He went on to point out that some individuals possess ears more easily injured by noise than others, and that much can be accomplished by finding these individuals and removing them to a quieter location. This can be accomplished by routine pre-employment audiometric hearing tests, followed by retests at regular intervals in all locations where there is excessive noise. He recommends that all workers in areas where the average sound level is over 90 decibels be given pre-employment audiograms and retests at not more than 30 days after work has begun.

Ways to control some kinds of industrial noises were described by an acoustical engineer, Hale J. Sabine, of the Celotex Corporation's research development department. The most obvious means of reducing noise exposure, he said, is to avoid close proximity of the ear to the primary source of noise. Next is reducing the noise output of the machine. This can in some cases be done by redesigning the machine, in others by reducing its speed of operation, and by proper repair and maintenance. Vibration isolators or mountings are effective in many cases, as they not only reduce noise, but also reduce floor vibrations, which have the same psychological effect as noise.

THE use of hoods, enclosures, or shields around noisy machines is recommended wherever possible. To be effective, said Mr. Sabine, these shields must be close-fitting and lined with highly-sound-absorbent materials, and must have a minimum of openings. The use of acoustical materials in floors, walls, and ceilings is also helpful. Wearing ear plugs, he said, can reduce noise in the ear 20 to 30 decibels. Each of these methods can reduce the noise level somewhat, but each has its disadvantages, and few industries can apply them all. Every employer, however, should study this problem and adopt all measures possible for the benefit of his employees and himself. It must be remembered that any reduction in the noise level, however slight, may bring it below the danger level.

Percentage Depletion Inequities Removed

WHEN the law was passed last year which extended the benefits of percentage depletion to thousands of nonmetallic minerals producers, there was discrimination—undoubtedly unintentional—against those whose fiscal year ended some time during 1951. The law provided that percentage depletion should be applicable "only with respect to taxable years beginning after December 31, 1950". As a result, calendar year companies obtained percentage depletion beginning on January 1, 1951. Fiscal year companies were forced to wait until the beginning of their next fiscal year. As a result, many had to wait until July 1, and some even until December 1, 1951.

Several efforts were made by interested companies and associations to have this law changed and all failed. Finally, however, an amendment was added to an Internal Revenue Bill, H.R. 8271. This passed both the House and Senate late on July 5, shortly before they adjourned. It was signed by the President on July 21 and is now law. All producers entitled to percentage depletion can now apply it, effective January 1, 1951.

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news of the industry

PIT AND QUARRY

Crushed Stone Producers May Adjust Ceilings Under Amended GCPR

J. R. Boyd, administrative director of the National Crushed Stone Association, has called the attention of crushed stone producers to the effect of the recent OPS approval of Amendment 1 to Supplementary Regulation 66, General Ceiling Price Regulation, upon the industry. This amendment permits ready-mixed concrete producers and building materials dealers (including crushed stone producers) to add to their ceiling prices the increased costs resulting from out-of-area purchases of crushed stone, sand, and gravel.

As amended, Supplementary Regulation 66 permits ready-mixed concrete producers and building materials dealers to add the increased costs (including purchase price of the material *and* increased transportation costs) of cement, sand, gravel, and crushed stone to their ceiling prices when, under the circumstances outlined in the regulation, it is necessary to go out-of-area to obtain such materials.

Basic's Kiln No. 13 Fired At Maple Grove, Ohio, Plant

On July 7 the new kiln at the Basic Refractories Maple Grove plant was fired for the first time. Kiln No. 13 was put in operation after a historic three-day complete shutdown of the plant, the first such occurrence in the experience of the firm.

Company spokesmen stated that the stoppage was due to curtailment of orders resulting from the steel strike. Only 200 of the plant's 500-man force were working when the new kiln was started.

Steele Re-elected Chairman Of Vermiculite Association

Members of the Vermiculite Association, Inc., met for the organization's annual meeting on June 24 at the Hotel Astor in New York. The following officers were chosen for the coming year: chairman, William S. Steele, president of the American Vermiculite Corporation (re-elected); vice-chairmen, Henri R. Bastien, president of Vermiculite Insulating, Ltd., Montreal, and N. M. Bernier, president of California Stucco Products of N. E. Inc., Cambridge, Mass.; and secretary-treasurer, William S. Elliott.

Achievements of the year just past were reviewed and new bulletins and the results of recent acoustical tests were approved for release. A new project will be a survey of transit and central-mix types of concrete mixing equipment.

Coming Events

August 17-23, 1952—State College, Pa. Sixth International Grasslands Congress.

September 3-6, 1952—Chicago. Fall regional meeting, Industrial Minerals Division, American Institute of Mining and Metallurgical Engineers; and fall meeting of A.I.M.E.

September 3-13, 1952—Chicago. 100th anniversary conclave, American Society of Civil Engineers.

September 22-25, 1952—Denver. Metal and Nonmetallic Mineral Mining convention and exposition, American Mining Congress.

October 20-24, 1952—Chicago 40th National Safety Congress and Exposition. Conrad Hilton, Congress, Morrison, Sheraton, and LaSalle hotels.

February 23-26, 1953—San Francisco. 37rd annual convention, National Sand and Gravel Association. Hotel Fairmont.

February 23-26, 1953—San Francisco. 23rd annual convention, National Ready Mixed Concrete Association. Hotel Fairmont.

Consolidated Rock Products Sets Fine Safety Record In Truck Transportation

Consolidated Rock Products Company of Los Angeles, one of the nation's largest producers of aggregates and ready-mixed concrete, is likewise the operator of perhaps the largest truck fleet in the industry.

During 1951 the company's vehicles covered nearly 10,000,000 miles of highway travel—9,712,520 miles, to be exact—delivering material to its customers and traveling between its 25 producing plants, distributing yards, and batch plants. Keeping this huge fleet in operation is the responsibility of Walter L. Good, transportation manager.

Accident prevention on the streets and highways is an important part of the program, and the 1951 record of 1.24 accidents per 100,000 mi. of travel was the best compiled since 1943.

Two types of hazards accounted for nearly one-half of the 120 accidents reported: (1) following preceding vehicles too closely, and (2) backing up without assurance that the path to the rear was clear.

40th Natl. Safety Congress To Convene October 20-24

On October 20 the 40th National Safety Congress and Exposition will open in Chicago. Sessions on industrial safety are scheduled for the Conrad Hilton, Congress, Morrison, and Sheraton hotels. Traffic safety sessions will be held at the Congress; commercial vehicle, transit, and farm safety sessions at the LaSalle; school safety sessions at the Morrison; and home safety sessions at the Conrad Hilton.

Further information will be supplied to those interested upon application to R. L. Forney, general secretary, National Safety Council, 425 N. Michigan Avenue, Chicago 11, Ill.

Fire recently destroyed the main building of the New Castle Lime & Stone Company at Hillsville, Pa. The blaze, cause of which is unknown, resulted in damage estimated at $25,000. The company markets crushed limestone, largely for agricultural use.

Cement Industry's Score In Safety 3rd Highest Among 40 U. S. Industries

Portland cement manufacturers have demonstrated that disabilities and suffering from accidental injuries can be prevented by consistent educational and engineering work. Likewise, loss of earnings and production time by employees can be reduced to a minimum; and what is good for the employees has proved good for the entire industry.

The last 36 years have seen the number of occupational injuries per 1,000,000 man-hours worked reduced 87 percent. For years cement has been named by the National Safety Council as one of the safest of the heavy industries. In 1951 only communications and electrical equipment made a better showing than cement among all 40 industries reporting to the Council, despite the fact that cement making involves the admittedly hazardous operations of quarrying, mining, and blasting, the use of high voltage electric current, intense heat, and some of the world's largest moving machinery.

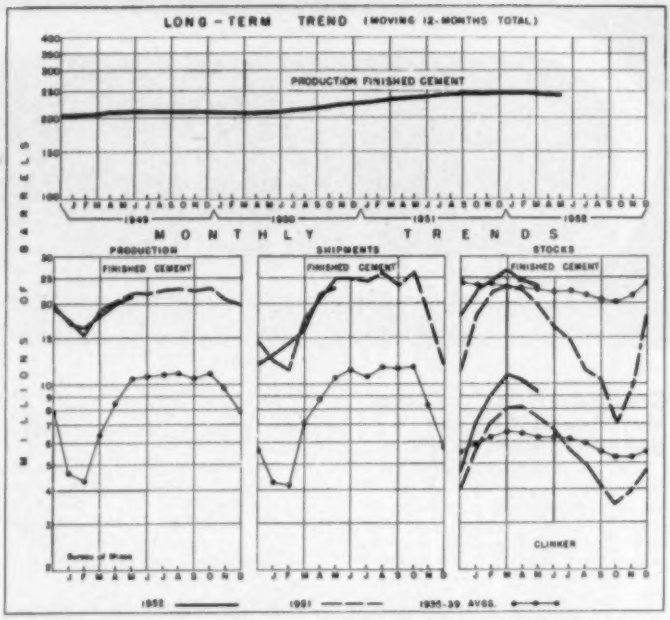
In the fast-moving year of 1951, the personnel of member company plants established the lowest accident rate in the 36 years of the Portland Cement Association's accident prevention work. The number of disabling injuries per 1,000,000 hours worked dropped to 4.22 or 13 percent below the 1950 rate, 50 percent below the rate of seven years ago, and fractionally lower than the previous best record of 4.26 set in 1939. While three times as much portland cement is being produced today as seven years ago, the injury frequency and severity rates are one-half of what they were seven years ago.

Advance information from national agencies studying accident experience indicates that industrial injury rates generally rose in 1951 with increased employment and production and longer working hours. However, it was the seventh successive year of progress in preventing accidents in member company mills and quarries, a gratifying result of energetic safety work.

The 1951 severity rate of 1.84 days lost per 1,000 man-hours worked was 3 percent below the 1950 mark and 8 percent lower than the rate for the three-year period 1949-1951. It was the second-lowest injury severity rate on record, being surpassed only by the rate of 1.80 achieved in 1932. The 1951 experience indicates that the intensified action taken by producers in the last two years to reduce exposure to severest hazards has been effective.

Special commendation has been given the employees of 95 quarries and mines among the 127 in the membership for not sustaining a single lost-time injury during 1951. In the previous year 85 of the raw-materials-producing operations had been successful in stopping accidents. Quarrying and mining is rough, dangerous work at best, but in the main experience has shown that extraordinary hazards can be surmounted with the use of extra care. Some of these operations have records of upwards of 20 years without a disabling injury to any worker.

The cement industry's success in reducing occupational injuries results from a carefully planned and humane approach to the problem of safety. Revision of work methods through engineering studies is a basic procedure. This is combined with the provision of mechanical safeguards where needed, plus persistent safety education, safety training, and competition for low accident records among employee groups. All these phases of the accident-prevention program are wholeheartedly supported by the Portland Cement Association membership.



SUMMARY—The output of 21,829,000 barrels of finished portland cement in May, 1952, as reported to the U. S. Bureau of Mines, was 0.4 percent less than that reported for May, 1951. Mill shipments totaled 23,282,000 barrels—a decrease of 6 percent, as compared to the May, 1951, figure, while stocks of 23,219,000 barrels were 19 percent higher than at the same time a year ago. Clinker production during May was 1 percent less than in May, 1951, and amounted to 21,044,000 barrels.

PRODUCTION—150 plants located in 37 states and Puerto Rico produced 21,829,000 barrels of finished portland cement during the month, as compared to 151 plants, which manufactured 21,924,000 barrels in May, 1951. Clinker production of 21,044,000 barrels was 1 percent less than that of the preceding May.

SHIPMENTS—Mill shipments of finished portland cement decreased 6 percent from the total shipped in May, 1951. Shipments were greater in 5 districts and lower in 14 districts than shipments recorded for May, 1951. The percentage changes range from a 39 percent increase in the Virginia-Georgia-Florida-Louisiana-South Carolina-Mississippi district to a decrease of 31 percent in Ohio. Shipments in Texas increased 11 percent. Marked decreases were noted for the eastern Pennsylvania-Maryland, Illinois, western Pennsylvania-West Virginia, and Colorado-Arizona-Wyoming-Montana-Utah-Idaho districts.

STOCKS—Mill stocks of 23,219,000 barrels of finished portland cement were reported at the end of May, 1952—19 percent greater than on the same date in 1951, while stocks of clinker amounted to 9,355,000 barrels—25 percent greater than at the same time last year.

American Aggregates Corp. Developing Lake for Fishing

A former gravel pit site at Richmond, Ind., covering some 35 acres, is being developed as a lake for a future fishing spot by the American Aggregates Corporation, Greenville, O. Fred Lamb is in charge of the project, which started when the gravel supply was exhausted.

A levee-type bank was built up with a roadway along the top to circle the lake. Waste materials, converted to fine sand, are being spread over approximately 10 acres of the lake bottom on one side, to make a beach. Bulldozers push the sand over to the water's edge, from where it gradually works out toward the middle of the lake.

Wayne Lakes near Greenville, formerly was another site owned and developed by American Aggregates Corporation.

The International Dragline, official publication of the Phosphate Division, International Minerals and Chemical Corporation, recently headlined a report of the division's outstanding accomplishment in passing the 2,000,000-hour mark without a lost-time accident. This set a new record—a world record—for open-pit mining.

A. A. Anderson of P.C.A. Named to New Post of Chief Highway Consultant

A. A. Anderson, former manager of the Highways and Municipal Bureau of the Portland Cement Association and nationally known technician in the concrete paving field, has been appointed Chief Highway Consultant of P.C.A. with headquarters at the Association's general office, 33 W. Grand Ave., Chicago. His former post will be filled by L. M. Arms, former assistant manager of the Highways Bureau.

Mr. Anderson joined the P.C.A. in 1923 as a field engineer in Kansas. Four years later he became an associate engineer for the Highways Bureau, and in 1935 was appointed regional highway engineer. Since 1936 Mr. Anderson has been manager of the Highways Bureau, directing the extensive activities of the Association's highway work throughout the country. In his new capacity he will handle special assignments of national importance in the paving field.

Mr. Anderson was employed by the Kansas State Highway Commission as a division engineer for several years prior to joining the Association. A member of the American Society of Civil Engineers, he was awarded the Arthur M. Wellington Prize for the most valuable paper on transportation presented before the Society in 1950.

Mr. Arms joined the Association in 1932, and in 1945 was appointed assistant manager of the Highways Bureau.

Mexican Plant Ups Capacity In Large-Scale Expansion

One of Mexico's most important portland cement manufacturers, "La Cruz Azul" (The Blue Cross), has just expanded plant facilities and added new equipment installations to its Lagunas subsidiary in the state of Oaxaca. Cement production has been increased to 500 tons a day, as compared with former production of only 100 tons. This firm has been operating for more than 20 years and has branch plants in strategic spots throughout the republic.

Arcadio Hernandez, managing director of La Cruz Azul, stated that the latest, most modern machinery had been installed, including a kiln measuring 350 ft. in length, mills, crushers, mixers, and three 1,200-hp. diesel units, bringing total horsepower in the plant to 4,500.

Universal Atlas Cement Company has announced that it will extensively modernize and rehabilitate its plant at Universal, Pa. According to Blaine S. Smith, president of the U. S. Steel subsidiary, recent studies show that the 45-year-old plant can still be operated on a profitable basis. The modernization program, which is already in the design stage, will include the installation of dust control facilities to meet requirements of the Allegheny smoke control ordinance.

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Du Pont Sesquicentennial Celebrated at Wilmington

At the ceremonies marking the 150th anniversary of the Du Pont Company, held recently at the site of the first Du Pont mill, Crawford H. Greenewalt, company president, delivered the major address. Other speakers who addressed the throng of more than 6,000 persons near Wilmington, Del., included Henry B. Du Pont, a vice-president and member of the firm's executive committee, and Walter S. Carpenter Jr., chairman of the board and a past-president.

Earlier in the program a historical dramatic prologue was enacted which depicted the founding of the company. Those who took part in the play, as well as members of the Du Pont chorus and the ushers, wore costumes of the early 19th century.

Cover Picture....

• On this month's front cover is an aerial view of the fuller's earth plant of the Floridin Company at Quincy, Fla. This deposit was first discovered in 1895 by farmers plowing in a field, and is believed to be the first such discovery on this continent. In 1951 a fire destroyed the greater part of this plant, but it was quickly rebuilt and is now one of the most modern operations of its kind. Originally fuller's earth was used chiefly as an oil-refining adsorbent, but this is now only one of its many applications. This company also operates a plant at Jamieson, Fla., and its home office and research development laboratories are at Warren, Pa.

Record Federal Aid To Highway Construction Still Called Inadequate

Federal aid to highways amounting to $1,385,000,000 for the fiscal years of 1954-55 hit an all-time high in the bill signed recently by President Truman. Congress had passed the measure on June 11 in the face of Administration demands for a cutback. Regular authorizations for state participation total $575,000,000 annually, including, for the first time, $25,000,000 for the Interstate Highway System.

Other major authorizations include $50,000,000 for defense access roads and a $10,000,000 emergency fund. In addition, miscellaneous authorizations for forest development and other public land roads total $77,500,000 annually. Provision is also made for the Inter-American Highway and the Rama Road in Nicaragua in the respective annual amounts of $8,000,000 and $2,000,000.

Lieut. Gen. Eugene Reybold, executive vice-president of the American Road Builders' Association, called the $25,000,000 authorized "sadly inadequate," and declared, "In agreeing upon this amount, (the Senate bill asked for $600,000,000) the committee was mindful of the fact that it will not stimulate any forward progress in taking care of the increased demands of the country."

Gen. Reybold in his testimony before both the Senate and House hearings on the highway bills pointed out that deficiencies on the Interstate System alone exceed $11,000,000,000, and the total needed improvement on the entire Federal Aid system had been established at upwards of $32,000,000,000.

He stressed the point that the seriousness of the highway situation indicated the need for the establishment of a definite long-range plan of rehabilitation. He suggested that a 10-year program, approximating a total annual expenditure of $3,000,000,000 would constitute a reasonable and realistic approach to the problem. Based on the present 50-50 matching basis, this would call for a yearly outlay of $1,500,000,000 in federal funds.

Augustus H. Gregg, Veteran Sand-Gravel Producer, Dies

Augustus H. Gregg, 82, pioneer sand-and-gravel producer in southern California, died on May 25. A native of Texas, he came by wagon train to Whittier, Calif., as an infant with his parents. He established the Sycamore Canyon Gravel Company near Whittier before the turn of the century. The business was later taken over by his son, John D. Gregg, who is at present one of the volume producers of aggregates in the Los Angeles area, operating as California Materials Company.

Mr. Gregg was prominent in real estate circles and as a grower of oranges, walnuts, and avocados. He established one of the largest cemeteries in Los Angeles County, Rose Hills Memorial Park, near Whittier, where burial took place May 27.

• Service men attending a school on the repair and maintenance of Unit Crane and Shovel Corporation products at Milwaukee, Wis. The men are from Unit distributors throughout the U. S.

Sanford E. Thompson Award Won by Gonnerman, Lerch

Harrison F. Gonnerman and William Lerch of the Portland Cement Association, Chicago, Ill., received the Sanford E. Thompson Award at the 50th anniversary meeting of the American Society for Testing Materials, held on June 25, 1952, at the Hotel New Yorker in New York City.

The award, one of three presented in recognition of outstanding technical papers, was won by the Gonnerman-Lerch paper on the subject, *Changes in Characteristics of Portland Cement as Exhibited by Laboratory Tests over the Period 1904 to 1950.* It had been presented at the annual meeting of the A.S.T.M. in June, 1951.

Mr. Lerch, administrative assistant in the P.C.A. Research and Development Division, had previously received the same award at the 1947 A.S.T.M. meeting for his paper *The Influence of Gypsum on the Hydration and Properties of Portland Cement Pastes.* Mr. Gonnerman, assistant to the vice-president for research and development, and a veteran of 30 years with the association, has twice received the Wason Medal of the American Concrete Institute for noteworthy research.

C. B. Alvord Appointed Head Of New U. S. Gypsum Dept.

Officials of the United States Gypsum Company have announced the organization of a new industrial merchandising department to assure a more concentrated market coverage for certain of its products.

In charge as manager of the new department is C. B. Alvord, who was formerly head of the firm's defense materials department, and previous to that, the northwest district sales manager of industrial products.

Also appointed to new duties in the industrial merchandising department are E. A. Klein, responsible for roof deck materials exclusively, and E. A. Ruth, in charge of merchandising sound control products.

April Lime Sales in U. S. Increase over March Totals

Domestic sales of open-market lime were 686,369 short tons during the month of April, as compared with 681,770 tons for March, according to reports of producers to the Bureau of Mines, United States Department of the Interior. The quantities sold for agricultural and building uses increased appreciably in April, whereas decreases were noted in the refractory, chemical, and other industrial uses. (See the accompanying table.)

Mallery Named Chairman Of N.L.A. Program Planning For Operating Meeting

Fred C. Mallery, superintendent, National Gypsum Co., Luckey, Ohio, has been appointed program chairman for the forthcoming operating meeting of the National Lime Association. The meeting is to be held September 15 to 17 at Mountain Lake Hotel, Mountain Lake, Va., and a feature of the gathering will be a tour of the nearby rotary kiln lime plant at Kimballton.

According to Robert S. Boynton, general manager of the Association, the program will feature quality control in lime manufacture. Further details will be provided at a later date. Amos Miner, National Gypsum Company, Buffalo, is chairman of the operating division of the Association.

Fred C. Mallery

Lime Sold by Producers [1] in the United States, Fourth Quarter 1951, First Quarter 1952, and April 1952, by Types and Major Uses, in Short Tons

	Total, 4th Quarter 1951	Total, 1st Quarter 1952	April 1952
By types:			
Quicklime	1,564,006	1,555,795	499,689
Hydrated lime	405,077	431,403	186,680
Total lime [2]	1,969,083	1,987,198	686,369
By uses:			
Agricultural:			
Quicklime	13,388	9,610	8,437
Hydrated lime	29,220	48,974	34,897
Total	12,608	58,584	43,334
Building:			
Quicklime	50,376	47,271	17,807
Hydrated lime	204,973	206,768	85,260
Total	255,349	254,039	103,067
Chemical and other industrial:			
Quicklime	989,614	978,781	312,724
Hydrated lime	170,884	175,661	66,523
Total	1,160,498	1,154,442	379,247
Refractory (dead-burned dolomite)	510,628	520,133	160,721

[1] Also includes a small quantity of captive tonnage (6-7 percent of the total reported herein) to maintain comparability with the annual lime statistics. [2] Approximately 60 percent of lime produced is high calcium and 40 percent high magnesium.

Safety Certificates Won By Slag Plants Having No Lost-Time Mishaps

Names of the plants receiving Certificates of Achievement in Safety awards from the U. S. Bureau of Mines in the National Slag Association safety competition now have been received. The following operations were so honored for having no lost-time injuries during a worktime of 20,000 or more man-hours during the contest year:

Birmingham slag plant, Sloss-Sheffield Steel and Iron Company, Birmingham, Ala.; 119,087 man-hours.

Dock No. 8 plant, The Cleveland Slag Company, Cleveland, Ohio; 82,387 man-hours.

Thomas plant, Birmingham Slag Company, Birmingham, Ala.; 66,185 man-hours.

Midland plant, The Midland Slag Company, Midand, Pa.; 62,403 man-hours.

Donora plant, The France Slag Company, Donora, Pa.; 49,905 man-hours.

Brier Hill plant, The Standard Slag Company, Youngstown, Ohio; 42,690 man-hours.

Monessen plant, Duquesne Slag Products Company, Belle Vernon, Pa.; 39,688 man-hours.

Benwood plant, The Standard Slag Company, Benwood, W. Va.; 39,021 man-hours.

N. D. Connelly slag plant, N. D. Connelly Company, South Chicago, Ill.; 36,482 man-hours.

Portsmouth plant, The Standard Slag Company, Portsmouth, Ohio; 35,887 man-hours.

Jackson plant, The Standard Slag Company, Jackson, Ohio; 32,483 man-hours.

Aliquippa plant, Duquesne Slag Products Company, West Aliquippa, Pa.; 20,235 man-hours.

The two trophy-winning plants—Fairfield Plant No. 5 of the Birmingham Slag Company and the East Toledo plant of the France Stone Company—also received the Achievement awards.

Canada Cement's Expansion Described by President

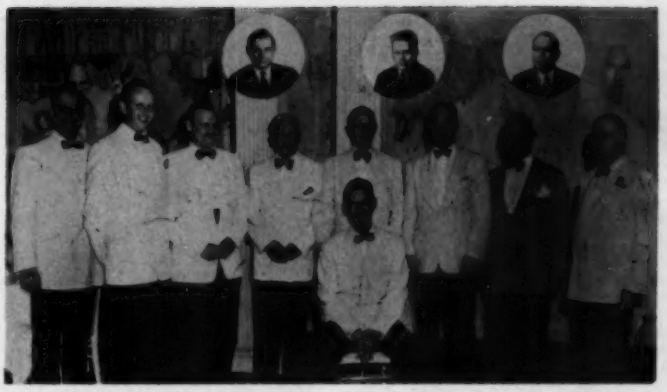
Canada Cement Company, Ltd., Montreal, Quebec, is now well advanced in its current expansion program, according to J. M. Breen, president of the firm. Mr. Breen outlined individual projects of the expansion program at the annual meeting of shareholders held recently in Montreal.

Mr. Breen reported that the company's new plant at Havelock, N. B., has been completed. He also stated that considerable progress has been made on the major extensions at the Exshaw (Alberta) and Belleville (Ontario) plants.

L. D. Childs Joins P.C.A. Staff As Transportation Specialist

Lawrence D. Childs, former research engineer with the Michigan State Highway Department, has joined the Portland Cement Association as a senior development engineer in its Transportation Development Section, according to a recent announcement by A. Allan Bates, vice-president for research and development of the Association.

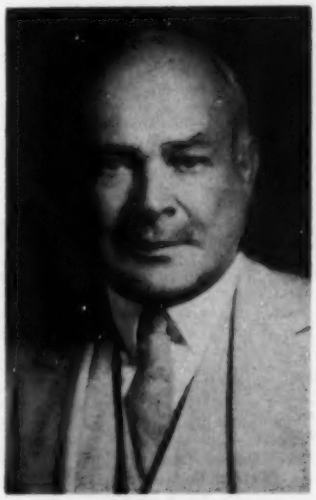
Mr. Childs served for seven years with the Michigan State Highway Department, where he conducted research and authored papers on important highway development projects, principally in connection with concrete pavement.



• Pictured above are the officers and the board of directors of the Industrial Diamond Association of America, Inc., who were chosen at the organization's convention at Hamilton, Bermuda, last May. Standing: Directors L. H. Metzger, Super-Cut, Inc., Chicago; W. G. Schwartz, Craine-Schwartz Diamond Tool Co., Detroit; J. N. Carter, Carter Diamond Tool Co., Cleveland, Ohio; Charles Slesinger, Charles Slesinger, Inc., New York; J. A. Ross, Sprague & Henwood, Inc., Scranton, Pa.; S. W. Hofman, Diamond Distributors, Inc., New York; I. J. Meade, Meade Industrial Diamond Corp., New York; and A. D. Leveridge, secretary-treasurer and executive manager. Insets show (left to right) W. F. Mullins, Werdiger & Mullins Co., New York, first vice-president; Piet Smit, J. K. Smit & Sons, Murray Hill, N. J., second vice-president; and F. E. Koebel, The Van Itallie Corp., New York. Seated is President H. E. Robison, Wheel Trueing Tool Co., Detroit.

Death Takes M. D. Wandell, Once Head of N. Y. Trap Rock

Mortimer Davidson Wandell, who was formerly president and a director of the New York Trap Rock Corporation, New York, N. Y., died on June 27 at his home in Pawling, N. Y., after an extended illness. He was 77 years of age.



M. D. Wandell

Mr. Wandell joined the Conklin & Foss Company, a pioneer firm engaged in large-scale crushed stone production, in 1899. In 1918 he was elected vice-president in charge of sales of the New York Trap Rock Corporation, an incorporation of the Conklin and Foss organization, the New York Trap Rock Company, and the Upper Hudson Stone Company. The merged concern at that time operated five large stone quarries along the Hudson River.

In 1927 Mr. Wandell became president and a director of the corporation. In 1938, however, he resigned because of ill health. He was widely known in the crushed stone and construction industries in the eastern states.

Funk Named to New Post On Perlite Institute Staff

The Perlite Institute, a national association of ore producers and processors of expanded perlite, has announced the appointment of Richard S. Funk to head its newly-created public relations department in New York City.

Mr. Funk was previously affiliated with a Cleveland advertising agency. He has also served as state editor of the Elyria (Ohio) *Chronicle-Telegram*, and was civilian manager of the War Department's photographic section in Munich, Germany, from 1945 to 1948.

The new department will coordinate public relations programs on an industry basis for the Perlite Institute's 48 members in 24 states.

In making the announcement, J. John Brouk, president of the Institute, cited the need for making available new technical information in the many fields in which expanded perlite is being used.

Lone Star Cement Corp. Announces Many Changes In Executive Lineup

At a recent meeting of the board of directors of the Lone Star Cement Corporation, R. A. Hummel was elected chairman of the board in which capacity he continues as chief executive officer of the Corporation. Succeeding Mr. Hummel as president is H. A. Sawyer,

H. A. Sawyer

formerly vice-president in charge of the company's Louisiana Division. Mr. Sawyer was also elected a member of the board of directors and of the executive committee.

The board also elected Th. Avnsoe to the newly-created office of vice-chairman of the board. Other changes in executive personnel include election of R. J. Mahon as vice-president for sales, C. C. VanZandt as vice-president for engineering, J. H. Mathis as vice-president and secretary, and J. W. Mather as vice-president for industrial relations.

R. A. Hummel

Officers re-elected to their present positions include Erle V. Daveler, chairman of the executive committee; Rosser J. Coke, vice-president; J. H. Leikhim, vice president and treasurer; A. C. Harragin, comptroller; and N. Pennicuik, assistant secretary and assistant comptroller.

H. A. Sawyer, the company's newly-elected president, has been associated with Lone Star since 1925. An engineer by training, he has also had wide administrative and selling experience. He joined Lone Star in 1925, serving in its Texas and New York offices until 1931, and since that date has held the position of vice-president and manager of the company's Louisiana Division, located in New Orleans. Succeeding Mr. Sawyer as vice president at New Orleans is Warren F. Smith, formerly division sales manager in that city.

New Contract Agreements Reached Between Cement Firms and Employee Unions

Within recent weeks several firms in the cement industry have reached contract agreements with the unions which represent their employees. The Petoskey Portland Cement Company and the United Stone & Allied Products Workers of America (C.I.O.) signed a one-year contract which granted a number of fringe benefits to some 275 workers. The company agreed to participate with employees in a program of hospital, surgical, medical, and life insurance. If the pact is approved by the Wage Stabilization Board, workers with at least one year's continuous service will get one week paid vacation, those with three or more years' service two weeks, and those with 15 years three weeks.

A new contract between the Marquette Cement Manufacturing Company and Local 164, United Cement, Lime & Gypsum Workers, (A.F.L.) at Cape Girardeau, Mo., provides a general wage increase of 10 cents per hour. The contract also contains a wage reopening clause which becomes effective in case the cost of living index on August 15, 1952, shows an increase of one percent or more above the February 15, 1952, level. Additional pay for the second shift is increased from 4 to 6 cents per hour, and the third shift differential is increased from 6 to 9 cents per hour. Other changes include increased benefits under the company's pension and group insurance plans. Some provisions of the contract must await approval of the Wage Stabilization Board.

A 7-week-old strike at Giant Portland Cement Company, Egypt, Pa., ended when employees voted unanimously to accept an agreement which boosts wages 8 cents an hour, grants 6 paid holidays, and provides paid vacations of three weeks for 15 years of service. Other clauses include maintenance of membership provision and improved grievance procedures. All terms of the new agreement are retroactive to April 1, 1952.

Union employees of the Carolina Giant Cement Company, Harleyville, S. C., returned to work after the signing of a contract which terminated a strike of two weeks. Terms of the agreement have not been disclosed.

An across-the-board general wage increase was an important feature of a new contract between the Huron Portland Cement Company, Alpena, Mich., and Branch 135, United Stone & Allied Products Workers of America. Other stipulations of the new contract provide 3-week paid vacations for employees with 15 years' service, increase the night shift differential from 5 to 10 cents an hour, and extend escalator provisions of the previous contract for another year.

The 75th anniversary of the founding of the Deutscher Zementverein (German Cement Association) was observed May 14 to 16 at Dusseldorf, Germany.

DPA Ups 1953 Cement Goal Another 6,500,000 Barrels

Goals for industrial expansion to produce an additional 6,500,000 barrels of portland cement in 1953 to meet deficits in five areas have been announced by the Defense Production Administration. This expanded production would be in addition to the total national supply of approximately 261,000,000 barrels previously estimated for 1953.

The areas and the amount of expanded capacity for each are as follows: New England states area, 1,000,000 barrels; the Carolinas 1,000,000 barrels; Mississippi - Louisiana - Texas - Oklahoma area, 2,000,000 barrels; Minnesota-Wisconsin area, 1,000,000 barrels; and Oregon-Idaho area, 1,500,000 barrels.

Sufficient applications for rapid tax amortization have been recieved in all areas, with the probable exception of the New England states, according to DPA. The establishment of this expansion goal does not constitute a commitment to furnish controlled materials for new plants and equipment, the DPA explained. The actual allotment of materials in each quarter will be conditioned by available supply and competing demands, the administration added.

Alonzo Mining & Milling Co. Plans Asbestos Operation

Construction of a plant for processing asbestos, reportedly to cost $250,000, will get under way this summer near Hernandez, Calif., by the Alonzo Mining & Milling Co. The plant will be located convenient to the deposits in southern San Benito County, in the Clear Creek area of the Coast Range.

Don F. Alonzo, president, expects that the new facilities will produce about 1,500 tons of finished fiber monthly for shipment to the Philippine Islands under a government contract. Approximately 300 men are expected to be employed in erecting the plant and developing the deposits, which encompass a 4-square mile area.

45 Safe Years in Plants Is Record Of S. Blowers of S.W. Portland Cement

AFTER spending 45 of his 50 working years in the mills of the cement industry, Seele Blowers of the Southwestern Portland Cement Company at Fairborn, Ohio, retired with one of the finest personal records in cement history —45 years of safety, with not a single lost-time accident to mar the story of those years of service. Moreover, he was never involved in an accident affecting a fellow workman.

In June, 1902, as a boy of 16, Mr. Blowers went to work in the packhouse of the Wabash Cement Company at Stroh, Ind. Soon he was transferred to the finish grinding mills, where he received his first safety lesson.

"My foreman gave me some general instructions," said Mr. Seele, "and then before he left me alone he said 'If you see anything going to pieces, see if you can fix it. If you can't, get away from it. We can repair the mills, but we can't repair men.'"

During the following years Mr. Blowers worked for the Burt Portland Cement Company at Bellevue, Mich.; the Wolverine Portland Cement Company, Coldwater, Mich.; the Medusa Cement Company, Dixon, Ill.; the Chicago Portland Cement Company, LaSalle, Ill.; the Chanute Portland Cement Company, Chanute, Kans.; and subsequently again for the Wabash Cement Company at Stroh. Since 1928 he has been affiliated with the Southwestern Portland Cement Company, at Fairborn.

His jobs took him to packhouse, mill grinding, kiln burning, repairing, and general operating departments. Naturally he has been exposed to all of the hazards that have existed in the average cement mill.

"What about the safety guards and equipment in the early years?" Mr. Blowers was asked.

"There were practically none," was the response. "I have seen screw conveyors running open for months at a time. Gears were without covers. Of course, the same as in many industries, there were transmission rope drives, line shafts, chain and belt drives. The mills were on belt drives, all without guards. We had no dust-collecting systems and there were days when we could hardly see across the millroom. You know, in those times the whole mill was practically under one roof. At night steam dynamos generated electricity for lights. They were not operated in the day time, and we used kerosene oil torches in the darker places. Just about every man had his torch."

As to the most frequent types of accidents, Mr. Blowers felt that screw conveyor mishaps were chief among the more serious and frequent. Falls were another source, and here he mentioned that ladders had to be used to get to the tops of bins and that stairways with railings were rare. The laboratory was used as the First Aid station for minor injuries because, as Mr. Blowers expressed it, "they generally had something on hand that could be used".

Another question was asked concerning the average foreman's attitude toward safety during the early years.

Seele Blowers

"Then," said Mr. Blowers, "the average foreman was more of the driving type, whose chief thought was to get the job done, and little or no time was given to doing it in the safest way. That's just the way it was, and neither foremen nor men gave much thought to it beyond ordinary caution. Today there is very little driving and much more attention is given to doing a job in the safest way possible. Now the foremen are much more careful about cautioning their men.

"I would like to mention that in Bellevue, Mich., back in 1913, we had a safety man who had lots of experience around the mill. When there was an accident, he was the first one on the scene, and he explained how it happened and how it could have been prevented. He spent most of his time in the mill and around the yards, and when he saw anything unsafe, it was his job to have it corrected. Believe me, when an experienced man stands back and sees things that can be done to make the work more safe, it certainly counts."

To him the first great progress in accident prevention efforts became strongly evident in the early twenties. "The use of dust collectors and the cement pump made a vast improvement in visibility and housekeeping. First Aid and safety committees helped a lot. Hazards from belts and gears, conveyors, and starting equipment are pratically gone. Well, I couldn't begin to name all of the changes for the better that have taken place."

Unassuming and quiet and justly proud of his safety and service experience, Seele Blowers has a philosophy which has been his guide through many years. Here it is:

"I have always been able to keep my head, take it easy, and not take any chances. From the first I have always tried to work out the safest and best way to do a job before I started it, and it usually came out right.

"Then I have another idea about safety in the mill (and I think we have done a pretty good job of it) and that is to have a place for everything and everything in its place. For example, when repair jobs are being done, the equipment brought in should be so placed that it will not be an undue hazard in the regular walking areas. This thought has occurred to me a good many times."

Big Cement Mill Shipment Sent to Italy by U. S. Firm

Italcementi, a large Italian corporation which operates more than 30 plants, soon will receive an out-size shipment of cement mill machinery from an American manufacturer. According to officials of the Kennedy-Van Saun Manufacturing and Engineering Corporation of New York and Danville, Pa., it is one of the largest single shipments of such equipment ever made. It was estimated that the freight volume of the machinery equals in size, weight, and displacement the shipping space required in a train of over 100 fully-loaded freight cars. Single sections of the equipment weigh up to 75,000 lb. and exceed 35 ft. in length.

Included in the shipment was complete equipment for two cement plants, each capable of producing 300 metric tons. The following parts were listed: primary and secondary gyratory crushers, swing jaw crushers; slugger rolls; vibrating screens; rock, apron, and disc feeders; air-swept tube mills; two kilns, each 231 ft. long by 10 ft. in diameter; exhausters, fans, cyclones, and radial classifiers; and pneumatic transport systems. Steam turbines and waste heat boilers are also included. In addition, complete electrical equipment such as motors, transformers, switch gear, control panels, electronic mill control, etc., also was supplied. Kennedy-Van Saun engineers will supervise the installation of the equipment.

The British Rugby Portland Cement Company, Perth, Australia, has announced plans to build a cement plant near Freemantle, with a capacity of 100,000 tons a year. Cost of the project, which will take from two to three years to complete, will be an estimated $4,500,000. A new proprietary company will be formed in Perth by Rugby Portland.

30 years ago in Pit and Quarry

By WALTER E. TRAUFFER

THE August, 1922, issue of PIT AND QUARRY was predominantly an operating issue, featuring articles on a number of new and outstanding plants. One of these described the phosphate rock and acid plants of the Anaconda Copper Mining Company, Anaconda, Mont., which pioneered the development of the vast phosphate deposits in Idaho. These deposits and those in adjoining areas of Montana and Wyoming have been exploited to an increasing extent in recent years and now supply a large percentage of the annual output of phosphate in this country.

This article described the geological formation of this vast deposit and the underground mining methods of recovery being used. The rock was then crushed, screened, and dried before going to storage. This mill had a capacity of 500 tons in 24 hours, which could readily be doubled.

The rock was shipped in railroad cars to Anaconda, where it was ground in ball mills to 60-mesh size. Complete details were also given of the manner in which the phosphate rock and sulphuric acid from the huge Anaconda smelters were mixed and treated to produce phosphoric acid and gypsum. The phosphoric acid was then mixed with ground phosphate rock and dried and ground into triple super-phosphate fertilizer. Many photographs were used to illustrate the entire operation.

Another article gave the details of the new plant of the International Silica Company at Elco, Ill., 20 miles from Cairo. The product was an inert silica which was sold chiefly as a paint filler and also as a rubber filler. In addition, ganister and bonding gravel were produced. A silica glass sand plant was also described--that of the Juniata White Sand Company, Mapleton Depot, Pa.

The Wahpeton Gravel & Sand Company in 1919 purchased a sand-and-gravel deposit at Thorosburg, Minn., and used a slackline cableway excavator system for loading out to cars. In this way the deposit was thoroughly explored. In 1921 a washing and screening plant was built to supply a growing need for road material in that area. This operation was covered in detail.

In this issue was reprinted in full a paper by Richard K. Meade, consulting engineer of Baltimore, Md. This paper, entitled *Quality Control in Cement Manufacture*, had been presented at the meeting of the Portland Cement Association in Atlantic City on June 27, 1922. Mr. Meade was an outstanding authority on the design and operation of cement plants. Much of the information and many of the ideas presented were new to the cement industry.

Rules for Blasting Rock was the title of a staff-written article which attempted to set up general rules which would help to make blasting in most quarries a less hit-or-miss proposition than it then was. Much of the advice given is still sound. In this issue also was a set of instructions showing graphically correct methods of loading dynamite and getting the highest possible efficiency from it.

In the news was a progress report on the construction of the Aetna Portland Cement Company's new cement plant at Essexville, Mich. Also in the news were some of the latest arguments for and against the construction of a state-owned cement plant in South Dakota. Details were also given of the fire which destroyed the Brixment department of the Louisville Cement Company's cement plant at Speed, Ind., at a loss of $125,000. The main cement plant, valued then at more than $1,500,000, suffered no damage.

J. A. Messenger Retires From Buell Engineering Staff

Joseph A. Messenger, vice-president, general manager, and director of the Buell Engineering Co., Inc., retired from his duties on July 1, 1952, to take up

J. A. Messenger

consulting engineering activities in Philadelphia.

Mr. Messenger has been at the heart of the 15-year growth of dust collection into a full-fledged industry. His was, from the start, a company specialization on high efficiency equipment. He pioneered in the rating of performance of dust recovery systems on a fractional efficiency basis.

In 1937 the art of dust collection was just starting to come into its own. In October of that year, Buell officials persuaded Mr. Messenger to assume the general managership of its destinies.

W. German Cement Output Hit 12,245,000 Tons in 1951

According to the West German Economics Ministry, the volume of West German cement production rose to 12,245,000 tons last year. In 1950 the total output was recorded as 10,880,000 tons.

Exports increased to 1,644,000 tons from 1,452,000 tons in 1950. Biggest customers were Brazil (with 21.8 percent of all exports), Holland, Argentina, and the United States. Domestic needs were covered, although the industry still was hampered by a coal shortage.

Jan.-June Building Total Approaches $15,000,000,000

New construction outlays for the entire country during the first half of 1952 reached a record total of nearly $15,000,000,000, according to a joint report of the Building Materials Division, U. S. Department of Commerce, and the U. S. Labor Department's Bureau of Labor Statistics.

Moderate expansion of most types of construction activity took place during June, with new construction totaling almost $3,000,000,000, up 7 percent over May and 6 percent above June, 1951. Private outlays of $1,900,000,000 in June were about the same as for a year ago, while public construction expenditures of nearly $1,100,000,000 were 23 percent larger than in June, 1951.

The first six months' total of new construction outlays showed a 4 percent increase over last year, resulting from substantially larger expenditures for military facilities, industrial expansion, and public utility construction. Military projects and defense plant construction were continuing to expand in June, but a declining trend in private outlays for new factories marked the completion of some important phases of the current industrial expansion program.

Private spending for residential building during the first half of 1952 was 8 percent less than a year ago. Practically all of the lower volume was in the first quarter of the year. In the opening months of 1952, the level of work on new housing under construction was considerably lower than that in the January-March, 1951, period when the unusually high rate reflected the huge number of houses and apartments started toward the end of 1950.

Officials of the Minnesota Mining and Manufacturing Company, St. Paul, Minn., have anounced the opening of a new regional sales office and warehouse in Atlanta, Ga. The facilities, designed to permit better service to customers in Georgia and neighboring states, are similar to the facilities in Buffalo which were opened within the last year.

Floridin Company Operates Modern Fuller's Earth Plant At Quincy, Florida

By C. L. SOWELL
Vice-President, Mfg.
Floridin Company, Quincy, Florida
and
F. L. BEATTIE
Processing Machinery Dept.
Allis-Chalmers Mfg. Co.

Open pit mining of fuller's earth at the Floridin Company's deposit, Quincy, Fla.

another P&Q exclusive

IN 1895 fuller's earth was discovered by some Alsatians while they were plowing tobacco in a field which is now the present site of the Floridin Company at Quincy, Fla. These Alsatians recognized the fuller's earth, believed to be the first discovered on this continent.

The products manufactured have increased from the original oil-refining adsorbent to a number of materials covering the field of adsorbtion. These include refining adsorbents, adsorbtive diluents and carriers of toxic agents, floor-cleaning adsorbents, filter powders and filter aids, gel-forming clays, desiccants, catalyst bases, and many others.

The Floridin Company was organized and incorporated in 1910 as an outgrowth of a number of predecessor companies. These concerns had been engaged in mining the deposits of high-grade fuller's earth occurring in the vicinity of Quincy since 1895. At the present time the company's physical structures include plants at Quincy and Jamieson, Fla., with home office and research development laboratories at Warren, Pa. The company employs at the present time an average of 275 men.

The Floridin Company has suffered two fires during its history, one in 1914, the other in 1951. When the 1951 fire destroyed the greater part of its fuller's earth plant, the Floridin Company quickly rebuilt and is today operating at Quincy, Fla., one of the most modern plants of its kind.

At the plant the gradual reduction system of grinding is employed, and several grades of product are turned out. In the rebuilt portion of the plant production is at the rate of about 20 tons per hour.

At Quincy most deposits of fuller's earth have an overburden which varies in thickness from 2 to 50 feet. As a result, recovery of the product is accomplished by an open or strip mining technique. After removal of the overburden at the mines, 6 to 10 miles distant, the fuller's earth is removed with a dragline, loaded into trucks, and transported to the plant site. Transportation was formerly done via a company-owned railroad, but trucking has proved much more economical.

An exterior view of the rebuilt plant of the Floridin Company.

The raw material is dumped directly into the primary crusher, a hammermill, or is kept under sheds in crude storage. Next, the material goes to the secondary double roll crushers.

In order to improve the fuller's earth for certain uses, the raw material goes through an extrusion process. The extrusion machines are equipped with 300-h.p. motors.

Before the next stage of grinding it is necessary to reduce the moisture content to approximately 6 percent. This drying process is accomplished in rotary dryers. From the dryers the product is transported to cooling bins before the next grinding and sifting stages.

From this point on, in the flow of the Floridin plant, new machinery had to be purchased as a result of the fire. It is interesting to note that with the exception of the "Aero-Vibe" screen, this new machinery is identical to that used in the flour milling industry for producing flour. As in the flour milling industry, it is necessary to mill fuller's earth by a gradual reduction system so as to minimize the "fines" or under-sized particles.

The new equipment of Allis-Chalmers manufacture includes one 4- by 10-ft. double-deck, enclosed-type Aero-Vibe screen; three 10-in. diameter by 42-in. long double roller mills; four 4- by 27-ft. metal-lined square sifters, and four all-metal stream dividers. All of these machines are driven by Allis-Chalmers motors and Texrope drives and control.

From the dryer, the product is flowed to the Aero-Vibe double-deck screen. The top deck is clothed with 1¼-in. opening wire which scalps out foreign material such as sticks, stones, etc. The product passes through the top deck onto the second deck, which is clothed with 8-mesh (8 openings per inch) wire. The overs of this wire are flowed to one pair of 10- by 42-in. rolls known as the "first break A rolls". The throughs of the 8-mesh wire are flowed to another pair of 10- by 42-in. rolls known as the "first break

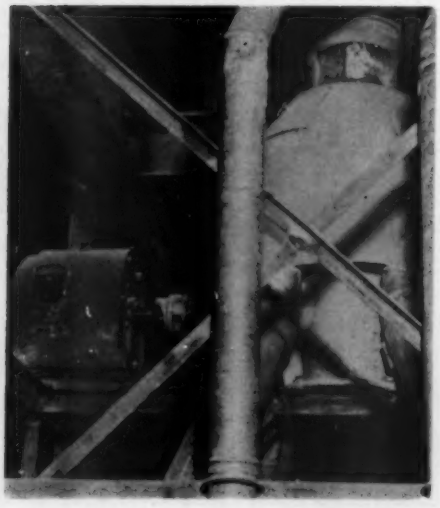
(*Continued on page 78*)

This 4- by 10-ft. double-deck, enclosed-type screen is used to scalp fuller's earth.

A view of the three 10- by 42-in. double roller mills.

Below: The four 4- by 17-ft. square sifters.

One of four all-metal stream dividers.



Slag Association Directors Award Safety Trophies, Discuss Problems

another ON THE SPOT report

MEMBERS of the board of directors of the National Slag Association met at the Sheraton-Cadillac Hotel in Detroit on July 9 and 10 to take part in the organization's regular mid-year meeting. As guests of the Edward C. Levy Company the group visited that firm's mod-

By WILLIAM M. AVERY

ern, high-capacity slag plant, as well as the nearby 1,200-acre River Rouge plant of the Ford Motor Company. Winners of the Association's 1951 safety competition received PIT AND QUARRY trophies in recognition of their achievement, and Bureau of Mines certificates for injury-free operations were presented to officials representing 11 plants in the industry.

Official actions taken by the group included the election of Harry J. Love as an honorary member of the board of directors, and of R. C. Jackson as a director representing the recently admitted Rockwood Slag Products Company of Rockwood, Tenn. E. W. Bauman, managing director and secretary of the Association reported briefly on the status of active projects. He disclosed that slag, as a by-product of an exempted raw material (pig iron), has itself been declared exempt from provisions of the Renegotiation Act of 1951. Mr. Bauman also reported that discussions with representatives of the Portland Cement Association have culminated in certain changes being made in that organization's pamphlet on the design and control of concrete mixtures. The revised recommendations no longer call for a higher cement factor for slag and crushed stone than for gravel.

Host and hostess for the slag industry's 1952 midyear meeting were Mr. and Mrs. Edward C. Levy of the Edward C. Levy Co., Detroit, Mich.

Dr. H. F. Kriege, France Stone Co., and W. C. Ireland, Birmingham Slag Co., who received the Class B and Class A Pit and Quarry safety awards won by plants operated by their companies.

Mr. Bauman announced that the National Slag Association will have a section in the next edition of Sweet's Catalogue File. The intention is to present specifications for certain recognized uses of slag, and to include a list of available publications covering the uses of the material. The members of the Association will also be listed by name.

The speaker referred briefly to OPS and NPA regulations as they affect the slag industry. He pointed out that the new law covering price control provides for the decontrol of unspecified commodities, and he expressed the opinion that inclusion under this provision should be one of the industry's important objectives. A secondary objective, Mr. Bauman said, should be nationwide price relief along the same lines as was recently granted to the ready-mixed-concrete industry. The speaker expressed the fear that the slag industry may soon be faced with a serious problem in obtaining its steel requirements, and he urged members of the Association to obtain serial numbers under the M-78 mining provisions of NPA regulations.

Referring to the industry's tonnage output in 1951 as an outstanding record, Mr. Bauman said that all industry members co-operated last year in providing production statistics, and that reports now come into Association headquarters almost automatically.

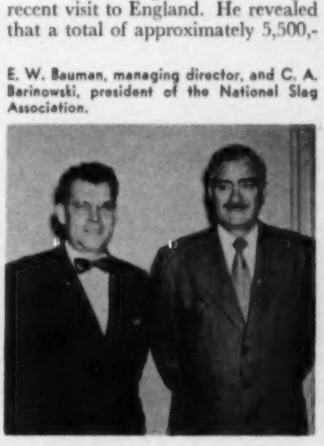
Fred Hubbard reported to the group in his dual capacity of chairman of the problems committee and director of research. He told of witnessing recent tests on slag masonry walls at Fire Underwriters Laboratories, and expressed confidence that the resulting reports will be favorable. One of the objectives of the tests, Mr. Hubbard pointed out, was to obtain a rating on expanded slag without any reference to trade names.

One of the most persistent questions raised concerning slag, Mr. Hubbard said, is in regard to its possible corrosive action in contact with metal. Although there are many examples which indicate that there is no relationship between the use of slag and the corrosive rate of metals in contact with the material, the question comes up again and again. A part of the trouble, Mr. Hubbard said, is the tendency to confuse slag with cinders.

The speaker described a research project now in progress which it is hoped will settle the corrosion question. Various metals are to be buried in trenches, some filled with various types of slag, and others with such competitive materials as sand and gravel and crushed stone. In about two years the test specimens will be dug up and studied to determine the relative effect of the materials with which they were in contact.

W. E. Bliss presented to the group a memorandum on his observations of the British slag industry during a recent visit to England. He revealed that a total of approximately 5,500,-

E. W. Bauman, managing director, and C. A. Barinowski, president of the National Slag Association.



000 tons of air-cooled slag, and 100,000 to 150,000 tons of lightweight or expanded slag, is marketed annually. Of the 28 slag plants now in operation, Mr. Bliss said, 25 are privately owned. He pointed out that about 60 percent of the air-cooled slag currently being marketed is sold in the coated form, and a considerable portion of the remainder is coated by customers before it is used.

According to Mr. Bliss, the air-cooled slag produced in England is literally an air-cooled product, since no water is applied either before or after the material is dug. As a result, the slag can be coated without the drying operation which is necessary in black-top production in the United States. Tar is used almost entirely, Mr. Bliss said, and the coating is applied without heating the slag.

One English firm, Tar Mac Limited located at Corby, operates two 3,000-ft. pits to handle a daily output of about 1,500 tons. The speaker noted that almost no molten slag is poured into the pits, since it is the practice to hold the slag in the pit for about 18 hours before dumping. Thus the material enters the pits in large balls which conform to the size and shape of the ladles.

W. E. Bliss, vice-president of the Standard Slag Co., Youngstown, Ohio, receives from President Barinowski the Certificates of Accomplishment in recognition of perfect safety records at his company's Brier Hill, Benwood, Portsmouth, and Jackson plants.

Wide use is made of the Gallai-Hatchard, or Gallai-Bed method of producing expanded slag, which Mr. Bliss described as consisting of porous concrete beds with water pipes underneath. The beds are proportioned to accommodate the size of the ladles being used, and the density of the expanded slag is controlled by regulating the thickness of the material placed on the beds. It requires about 15 minutes to foam the contents of one ladle (8 to 15 tons), and the average dry weight of the expanded material is around 32 lb. per cu. ft.

Two guest speakers, engineers representing Wayne County and the city of Detroit, addressed the group at luncheon meetings, one held at the Dearborn Inn on the first day and the other at the Sheraton-Cadillac on the second day. Both men discussed the slag industry's product in very favorable terms, indicating that from their extensive experience the material has proved itself thoroughly. Gus Worth, chief testing engineer for Wayne County, stated that slag has proved to be an excellent material for obtaining the desired amount of air in air-entrained concrete. He called attention to the fact that water cooling seems to impair some of the desirable characteristics of slag, and that air-cooled material is preferable for use in concrete.

George Thompson, chief engineer of the city of Detroit, referred to the wide range of purposes for which slag is now used. He said that slag has played an important role in meeting the tremendous demand for improved streets and highways resulting from the rapid rate of population increase in the Detroit area. The city alone, according to Mr. Thompson, buys about 170,000 tons of the material annually, and contractors use an additional 150,000 tons. Although the area now produces about a million tons per year, the speaker stated that the supply is still not adequate for all needs.

One of the features of the Detroit meeting was an inspection tour of the Levy Company's modern slag plant located on the outskirts of the city.

Members of the inspection party watch one of the company's huge trucks delivering slag reclaimed at the pits of the Ford Motor Company.

An important item of business at one of the luncheon meetings was the presentation of trophies and certificates in the Association's third annual safety competition. Highest honors, consisting of bronze plaques provided by PIT AND QUARRY magazine, went to the Fairfield plant No. 5 of the Birmingham Slag Company and the East Toledo plant of The France Stone Company. Operating 180,657 man-hours without a disabling injury during the contest year from April 1, 1951, through March 31, 1952, the Fairfield plant won the Class A trophy for entries with more than 60,000 man-hours of exposure. Birmingham Slag Company's Thomas plant won the award in 1949, and their Wylam open-hearth plant took top honors in the 1950 contest. Charles W. Ireland,

(*Continued on page 78*)

Aggregates Production At Albeni Falls Dam

ALBENI Falls Dam, currently under construction as a $31,070,000 project of the Army Corps of Engineers on the Pend Oreille River in Idaho, is unique in that it was authorized, had funds appropriated,

By Harry F. UTLEY

and construction started within the space of a single year!

Designed primarily for flood control and the generation of power, the dam is but one small unit of the broad Columbia River Basin development program. The spillway section will be 90 ft. high and 700 ft. long. The hydro-electric installation will consist of three turbines driving generators with a total rating of 42,600 kilowatts.

The construction contract for the present work is held by Donovan & James, St. Paul, Minn., and approximately 140,000 cu. yd. of concrete is going into the spillway and powerhouse. The necessary aggregates are being produced under subcontract by the Curtis Sand & Gravel Company of Spokane, Wash., in a simplified 150-t.p.h. plant erected on a river deposit a short distance upstream from the construction site. Operations began early in 1951 and the spillway dam and subsequent placing of cofferdams blocking the powerhouse channel are scheduled for early completion.

• Pit-run material at the Curtis dam-site plant is scrubbed and the sand is then taken out by the screen shown. The conveyor (left) brings the dry make-up bank sand to the screen. The long pivoted conveyor (background) stockpiles the finished blended sand for drainage.

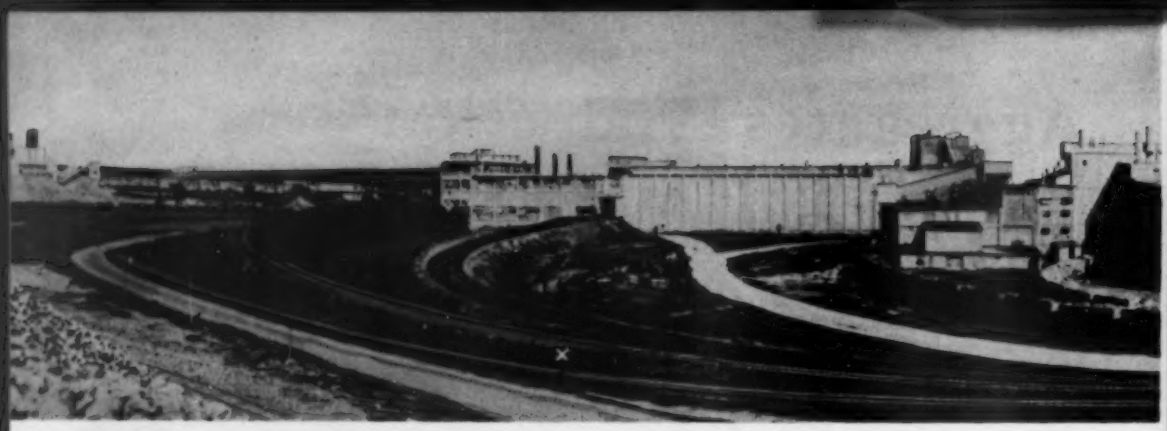
The pit operation is simply one of dozing the material into a hopper, from which a Pioneer 30-in. plate-feeder puts the pit-run on a 24-in. by 100-ft. belt conveyor leading up to a revolving scrubber. Coming off the scrubber, the wet material is subject to initial separation by a Simplicity 4- by 12-ft. double-deck screen which takes out the sand (minus 4-mesh). The pit-run is markedly deficient in fines, and this is made up by hauling from a nearby sand bank, the trucks dumping into a separate hopper feeding an 18-in. by 60-ft. conveyor which deposits the sand on the double-deck screen just mentioned, along with the pit-run from the scrubber.

Sand specifications on this job are not quite as rigid as those encountered on some of the larger dam projects in the Pacific Northwest. Control of the blend is largely achieved by regulating the addition of the make-up bank sand which augments the pit-run, fineness modulus limits being in the rather broad range of 2.40 to 2.90, with an allowable variance not to exceed .10. All the minus 4-mesh sand from the screen is dewatered by a pair of 30-in. screws and stockpiled for drainage by a 24-in. by 120-ft. conveyor.

Gravel retained on both decks of the primary screen is carried by a 24-in. by 100-ft. belt conveyor to a bunker with a spray-equipped Simplicity 3-deck screen overhead. Top-deck rejects (plus 3-in.) are wasted, while the three coarse products—minus 3- plus 1½-in., minus 1½- plus ¾-in., and minus ¾-in. plus No. 4—are finished sizes which drop to three truck-loading bins for transportation to the concrete plant

(*Continued on page* 91)

• Unclassified coarse aggregate is brought by the conveyor (left) to a 3-deck washing-and-sizing screen over the bunkers. All plus 3-in. gravel is conveyed to a waste pile (right).



Many Facets to Huron's Program For Increased Output of Cement

By WILLIAM M. AVERY

IN recent years it has been scarcely possible to prepare a review of important developments in the portland cement industry without special reference to activities of the Huron Portland Cement Company. Since the end of World War II Huron's gigantic mill at Alpena, Mich., has been in an almost continuous process of expansion. During that period the company has installed six new 10- by 153-ft. rotary kilns, two of which were placed in operation in 1950.

These additions have brought to 20 the total number of kilns in production and have been instrumental in jumping total annual output to an almost astronomical level somewhat in excess of 7,000,000 bbl.

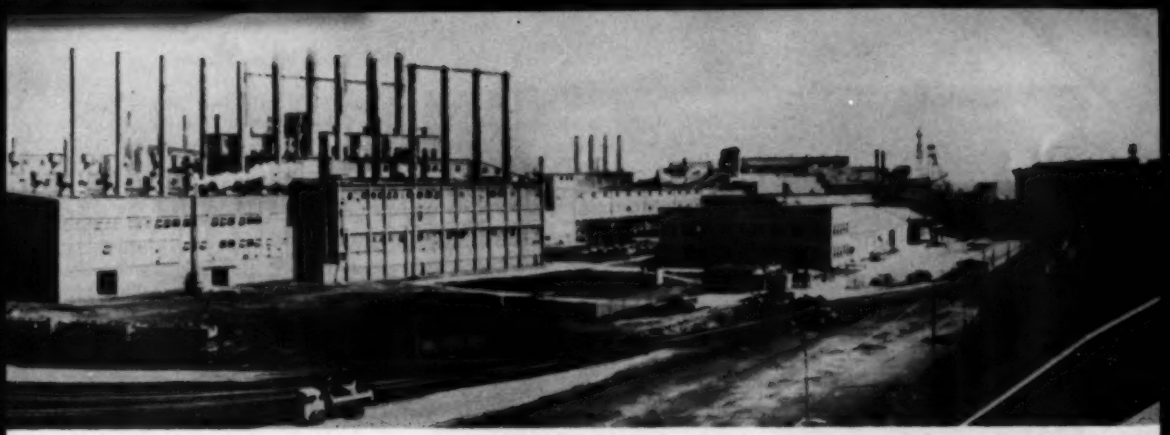
We use the phrase "have been instrumental" advisedly, for not all of the increase has been due to the installation of new kilns. The company's engineers and production men have worked almost as hard to obtain increased output from existing facilities as they have to build new facilities, and the result of their efforts is by no means inconsequential. Of some 3,300,000 bbls. of annual output added since V-J Day, about one sixth, or approximately 550,000 bl., has come about through direct improvement in output per kiln-hour. In turn, this increase per kiln was the result of better utilization of existing facilities.

The raw mill provides a prime example of how such gains were achieved. Some excess raw grinding capacity was available to take care of the two new kilns installed in 1950, but on the basis of past performance it appeared that the nine mills could not possibly turn out enough raw mix to supply the new kilns. Operating in closed circuit with 14-ft. Sturtevant mechanical air separators, each of the 7- by 26-ft. Compeb mills was producing just under 20 t.p.h.

Adopting a "let's see what we can do attitude", the company equipped one of the mills for pilot operations, so that it would be possible to determine with some accuracy the results achieved by various changes in both equipment and practice. Experiments carried out over a period of months indicated that an increase of around 50 percent could be achieved if certain changes were made. An important part of this gain resulted from increasing the circulating loads from approximately 50 percent to around 200 percent. To accomplish this plain division heads were installed in the mills to replace the grids, making it possible to operate the units as modified tube mills. Mill speeds were also increased, and a Hardinge Feedoweight was installed ahead of each unit to assure a uniform maximum feed rate.

As an additional means of enabling the existing raw grinding plant to meet the increased demand, five new 500-ton steel storage tanks were installed between the raw mill and the No. 2 kiln room. Thus it is possible to store considerable

• Below: Clinker produced by the newest kilns is loaded into bulk carriers for shipment to Huron's new finish-grinding mill at Superior, Wis.



• A panoramic view of the world's largest cement mill, operated by the Huron Portland Cement Company, Alpena, Mich.

A summary of recent and current activities designed to increase production of world's largest mill

quantities of raw mix during periods of reduced demand, and to draw on this additional surge capacity as a means of equalizing the two operations.

Some part of the increased raw mill output is attributable to the development of a new and remarkably effective system for selective dust return to the mill circuits. A complex system of F-H Airslides, screw conveyors, and elevators delivers all the dust from the Cottrell collectors, and from the boilers, kiln housings, and economizers, to a 500-ton cone-bottom steel tank. An F-H Airfeeder delivers the material to a screw conveyor, the feeder being controlled by means of a Bin-Dicator located in the conveyor housing. The flow is elevated and discharged into an 18-in. screw conveyor located below and to one side of the raw mill separators.

At each of the nine mills a Jeffrey-Traylor vibrating feeder takes dust from the screw conveyor and discharges it into an Airslide. These feeders can be adjusted individually by means of rheostats to equalize the feed to each of the nine circuits, with a master control for simultaneous variation of all units in accordance with the volume of dust available. To assure a uniform rate of feed to all circuits, the rate of discharge into the 18-in. screw is substantially in excess of requirements; overflow material is returned to the storage tank by means of Airslides and a bucket elevator.

Instead of feeding the dust into

• Above: One of the new rotary kilns installed in the course of Huron's most recent expansion program.

• Right: The mill crew placing firebrick lining in one of the new rotary kilns.

• The automatic weighing device provides an accurate record of clinker produced with a full-sized pilot kiln.

the raw mills, the material is blended into the mill streams going to the air separators. Thus only the coarse material is reground, and a substantial as well as unproductive load is diverted from the mills. This practice has also resulted in a much more intimate blend than was formerly achieved by refeeding directly to the mills. The system provides for refeeding all or any desired portion of the 200 to 250 tons of dust recovered daily.

Well pleased with the result of the experimental work in the raw mill section, the company officials decided to equip one of the two kilns installed in 1950 as a pilot kiln. The principal feature incorporated for this purpose is an accurate and reliable device for weighing the clinker produced. Clinker drops from the cooler onto an apron conveyor which discharges into a hopper. When something over 500 lb. is in the hopper, the in-feeding conveyor stops automatically and an apron conveyor on a Richardson Nicaro scale then discharges exactly 500 lb., leaving a small increment in the hopper for the next weighing. The scale has a counter which is read each shift to maintain a complete and very accurate record of the number of pounds of clinker produced. Thus, with a separate daily record of performance available, there is no element of guesswork in evaluating the effect of experimental variations in practice, and the findings may be quickly applied to the other kilns in the plant. The pilot kiln has been equipped with a Hays automatic oxygen analyzer, but with this exception it incorporates the same control features as the other kilns installed in recent years.

A modification of the Fuller Constant-Head Feeder is used for feeding each of the newer kilns, and eventually all the kilns will be similarly equipped. Raw mix is withdrawn from each storage tank, elevated, and discharged into a circular surge tank in which the material overflows into a 14-in. variable-speed screw conveyor synchronized with the kiln drive motor. Each unit is carefully calibrated in pounds of raw mix per revolution of the feed screw so that there is no guesswork about the amount of feed going to each kiln. The method also prevents aeration of the raw feed, thus eliminating another possible source of error in the feeding operation.

The two 10- by 153-ft. kilns installed in 1950 are identical in most respects with the four units placed in service shortly after World War II. They were built by Allis-Chalmers, and are fired individually with Raymond No. 452 direct-fired bowl mills, using automatically-regulated hot air off the kiln hoods to dry the fuel. Feeders ahead of the bowl mills are driven by Louis Allis Ajusto-Spede motors, the output speeds of which are controlled electronically by means of eddy-current couplings.

All the kilns at Alpena are equipped with waste-heat boilers, the newer installations consisting of Wickes 1,000-hp. bent-tube boilers which generate 24,000 to 40,000 lb. of steam per hour. Feed water is heated with Green fuel economizers. The new kilns have two-speed drive motors and are equipped with 6- by 20-ft. Fuller grate coolers which discharge clinker at temperatures not exceeding 120 deg. F.

Huron designed and built the graded-resistance, plate-type electrical precipitators with which the new kilns are equipped. These units have a collecting efficiency of approximately 95 percent. In previous installations dust handling was provided for by means of screw conveyors operating out of a series of hoppers. In the case of the two kilns installed in 1950, dust from the three primary sources (precipitators, economizers, and boilers) drops into a line of 17 double hoppers from which it is fed to a single screw conveyor by means of Fuller-Huron Airfeeders and F-H Airslides. Each hopper has a set of Bin-Flo units on one side to assure free-flow of the materials, and air is admitted to the feeders through solenoid valves.

The system operates on a timer, the cams of which can be adjusted

• Right: The newest kilns are fired individually with direct-fired bowl mills, using automatically-regulated hot air off the kiln hoods to dry the coal.

• Below: The arrangement of air feeders and conveyors for handling dust from hoppers, boilers, precipitators, and economizers.

so that all the dust is blended together, or any fraction may be segregated, as desired. Manual cleaning is virtually eliminated, since the system automatically takes care of all sources except the kiln housings. Airfeeders under the boilers are equipped with porous Alundum blocks in order to handle dust at 1,100 to 1,200 deg. F., while those under the precipitators and economizers, where dust temperatures run less than 450 deg. F., are fitted with combination glass cloth and canvas membranes. This installation has shown such outstandingly excellent results that Huron plans eventually to apply it to all of the kilns.

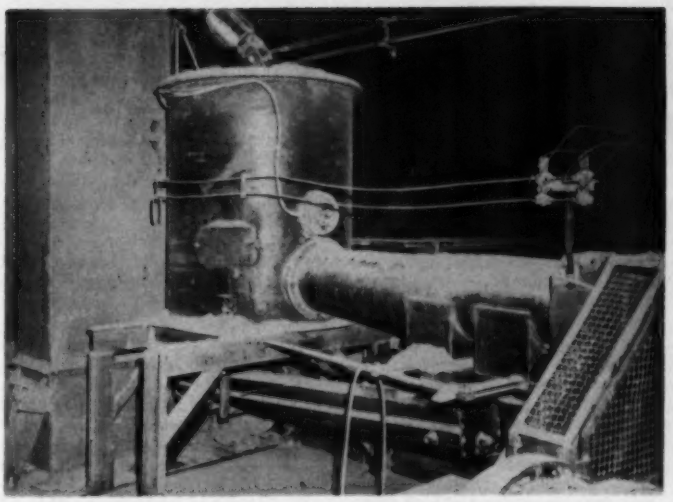
As an integral part of the most recent expansion program at Alpena, Huron designed and built a complete clinker grinding mill at Superior, Wis., and most of the output of the two new kilns was definitely tied in with this new finish-grinding capacity. This plan was adopted in order to serve the Upper Great Lakes region without building prohibitively costly silos for storing enough finished cement to meet requirements during the long season (about five months) when the Upper Lakes are closed to navigation. Raw clinker is shipped from Alpena in ordinary bulk carriers, and a sufficient quantity is accumulated in storage at Superior to meet requirements during the winter months. The mill at Superior has a capacity somewhat in excess of 2,500 bbl. per day, and the installation includes packing facilities and six cone-bottom storage silos with a total capacity of 52,000 bbl.

Special provisions were made at Alpena for storing and loading out clinker for the new grinding mill at Superior. Storage space for about 160,000 bbl. of clinker has been set up in one corner of an existing clinker pit, with five steel hoppers and as many Jeffrey vibrating feeders for feeding the material onto 30-in. belt conveyors. The latter discharge onto a 36-in. belt, and subsequent units elevate and convey the material over the roof of the finish-grinding mill to the loading dock, where a single shuttle belt can be positioned to discharge into the hold of the vessel being loaded. Each of the vibrating feeders is rated at about 300 t.p.h., and normally only three (or occasionally four) of the units are operated simultaneously.

The reclaiming system was designed for loading vessels at the rate of about 1,000 t.p.h., but the belt conveyors are equipped with two-speed drives, so that the rate may be cut in half when it is desired to use the same facilities for feeding the finish grinding mill. Although a sizable amount of clinker can be reclaimed by gravity, a bulldozer is used at times to place additional material over the feeders. Certain walls have been removed from the storage pit, so that an almost unlimited amount of clinker can be stored during the winter months. To date the system has had occasion to accommodate as much as 1,500,000 bbl. of clinker. A close check is maintained on the material stored for shipment to Superior by simultaneously feeding some of the same kilnrun clinker to the finish mill at Alpena.

Within the last few years all the grinding mills at Alpena, as well as other critical spots in the plant, have been equipped with dust collectors. The nine mills in the raw section and the 12 in the finish-grinding department are tied in with American Dustube bag-type collectors, and various other points are served by Parsons units. The Cottrell precipitators which serve the stone dryers have been enlarged and rebuilt to obtain greater capacity and higher efficiency, and four rod-curtain units which serve the shale dryers are in process of being rebuilt.

Another major project in which the company is currently engaged is the modernization of its shale quarry, which is located about 12 miles from the mill. The job involves the installation of a completely new crushing plant of 450 tons' hourly capacity, located on the



• This modified constant-head feeder, developed for feeding one of the new kilns, will eventually be adapted to all units in the plant.

• Right: The installation of rod-curtain precipitators which serves the stone dryers.

quarry floor with reserve storage and a belt conveyor system for stocking out and reclaiming. At the same time the quarry operation will be converted from rail to truck haulage.

Huron generates all the power used in its own operations at Alpena, and in addition sells power to the adjacent Wyandotte Chemical Corporation, from which Huron in turn purchases limestone. With the steady expansion of productive facilities in recent years, the power load has increased to the point where there was virtually no reserve at all. To relieve this situation, work was started last year in preparation for the installation of a new 12,500-kw. Allis-Chalmers turbine. This unit, which will go into operation some time this summer, will bring total generating capacity to around 36,000 kw., providing a generous margin over the present demand load of approximately 23,000 kw.

Also nearing completion is a new reservoir and pump installation which will increase capacity from 40,000 to 75,000 g.p.m. The reservoir has been built about 11 ft. above grade in order to provide sufficient elevation to establish head in the cold well at the engine room, to which it is connected by a 6-ft. diameter concrete pipe line. The three supply pumps are low head vertical units which do not require priming. Two are motor driven for regular service, while the third has a turbine drive for standby in the event of a power failure. The reservoir capacity is around 20,000 gal.

Huron's long-range program for the replacement (where applicable) of screw conveyors with F-H Airslides has shown steady progress. Well over 5,000 ft. of Airslides are now in operation throughout the plant, showing an impressive saving in power consumption and maintenance costs. Additional applications since the subject was last covered in these pages are chiefly in the handling of hot materials.

Almost the entire output of cement at Alpena is shipped by water to Huron's network of distributing and packing plants throughout the Great Lakes area. The company's three steamers, the *S. T. Crapo*, the *John W. Boardman*, and the *Samuel Mitchell*, have a combined cargo capacity of 20,000 tons. A fourth vessel of 6000 tons' capacity was bought last December and is now being converted to a bulk-cement self-unloader at the Hoboken Yard of the Bethlehem Shipbuilding Corporation, from which she will be brought to the Great Lakes this fall. This vessel has been renamed the *Paul H. Townsend* in honor of Huron's vice-president and general manager. She will be equipped with the same Airslide system for unloading that has proved so successful on the *Samuel Mitchell*. The 12 distributing plants, each of which operates in conjunction with a full-staffed district sales office, are located at Duluth, Minn.; Green Bay, Superior, and Milwaukee, Wis.; Alpena, Saginaw, Muskegon, and Detroit, Mich.; Toledo and Cleveland, Ohio; and Buffalo and Oswego, N. Y. The Green Bay plant, which is the newest as well as one of the largest units in Huron's distributing network, is one of the finest installations of its kind in the cement industry, incorporating many features of automatic control and the maximum amount of flexibility in the handling, packing, and loading of five types of cement. The 12 storage silos and interstice bins have a total capacity of about 100,000 bbl. Major use is made of both Airslides and Airfeeders in the various handling circuits.

At this writing, Huron's peak productive capacity is somewhat in excess of 20,000 bbl. per day, and annual output is running well over 7,000,000 bbl. Having regard for the company's persistent efforts to improve and refine every phase of its operations, there is no reason to expect that either of these figures will remain static, even with the existing equipment. Huron's alert management and top-notch supervisors have proved over and over again that there are actually no rigid ceilings on the productive potential of intelligently operated plant facilities.

However, increases in production will not be left entirely to improvements in methods and procedures. Still further expansion is scheduled. The directors have authorized the purchase and installation of four new kilns and the necessary raw and finish mills to take care of the increased clinker. This equipment will add some 2,000,000 bbl. to Huron's Alpena production. Bids are now being taken on the machinery, and completion is scheduled for some time in 1953.

Floridin Company

(*From page* 70)

B rolls". Both the A and B break rolls are contained in one double roller mill; each pair of rolls has its own feeder and adjustments for roll spacing.

After passing through the first break A rolls the product is flowed to a 4- by 27-ft. square sifter which removes the oversize and classifies the remainder into four marketable-size products. The over-size from this sifter joins the stream from the Aero-Vibe double-deck screen and is fed to the first break B rolls.

The material from the first break B rolls goes to another sifter, where the over-size is removed and the remainder classified into the four marketable sizes. In turn, the over-size from this sifter flows to another double roller mill and then to another sifter. Each roller mill grinds a little more of the fuller's earth to the desired sizes and each sifter separates the over-size from the marketable-size products, which are minus 16 plus 30, minus 30 plus 60, minus 60 plus 90, and minus 90-mesh.

The Floridin Company employs four stages of grinding and four stages of sifting in its system of flow. By so doing, the minimum of fines is produced, that is, particles that are smaller than the four marketable-size produces.

All of the roller mills and sifters have suction connections tied into a cyclone-type dust-collecting system, and the dust produced in the machinery is immediately drawn off. This results in clean working conditions for plant personnel. In addition, the dust collecting system has eliminated a nuisance to the surrounding neighborhood; real savings in material are also effected. It is estimated that the increased revenue from materials reclaimed with the dust-collecting system paid for the system in four months' time.

From a few uses in 1895, the uses of fuller's earth have grown to dozens at the present time. Known crude supplies in the Gadsden County, Fla., area are adequate for more than 100 years.

Slag Assn. Directors

(*From page* 72)

president of the company, and William C. Ireland, vice-president in charge of slag plant operations, accepted the trophy in behalf of the employees of the Fairfield plant.

In winning the Class B trophy for plants having less than 60,000 man-hours of exposure, the East Toledo plant of The France Stone Co. operated 55,432 man-hours without a lost-time injury. Similar honors were won by this company's plants at Chicago and Donora, Pa., in 1949 and 1950 respectively. Dr. H. F. Kriege received the award in behalf of the employees of the East Toledo plant.

Of the 45 plants which competed in the 1951 safety contest, 17, in-

(*Continued on page* 81)

50th Anniversary of A.S.T.M. Celebrated at New York Meeting

By C. E. PROUDLEY
Chief Materials Engineer
North Carolina State Highway and Public Works Commission

ACHIEVEMENTS through 50 years of work since its incorporation furnished the theme for the annual convention of the American Society for Testing Materials in New York June 23-27, 1952. President T. S. Fuller keynoted the meeting at the President's Luncheon with an address on *Some Gratifying Results,* during which he recounted the advancement in number, scope, and recognition of the Society's specifications and methods of testing.

Limitations of hotel facilities prevented many of the 2,608 who registered for the meeting from attending the luncheon. Upon this occasion the Society's Award of Merit was conferred on Wheeler P. Davey, George H. Harnden, Jay C. Harris, Jerome J. Kanter, H. S. Mattimore, Douglas E. Parsons, Hugh M. Robinson, John D. Sullivan, Ray Thomas, and Fred D. Tuemmler. These awards are made for intensive work and contributions in certain specific fields and also for aiding in furthering the general activities of the Society.

As a special feature of this meeting delegates from foreign governments, American and foreign societies, and trade groups were recognized and each, in turn, responded. Dr. R. E. Zimmerman, vice-president, United States Steel Company, represented the American groups in his talk, *Technical Minds Meet;* and Dr. Albert Caquot, president, International Standards Organization, responded for foreign delegates.

The loss of A.S.T.M.'s late executive secretary, C. L. Warwick, beloved by all members, as well as all others who knew him, also was appropriately commemorated at this session.

This was the year for the tenth exhibit of testing apparatus and laboratory supplies—an event which is always of intense interest to those who attend the annual meeting in the even years. A new feature of the convention made possible by reason of its being held in New York City was an arrangement for open house at the laboratories of the organizations in the vicinity of the meeting. This was ably managed through the efforts of Lincoln T. Work, consulting engineer, New York City. All plans for the 50th anniversary meeting of the Society in New York were under the general chairmanship of H. C. R. Carlson, The Carlson Company, New York City. (No one will hold Mr. Carlson responsible for the record heat and the occasional failure of air-conditioning in the hotels and meeting rooms.)

The Charles B. Dudley Medal, presented by the Society for a paper of outstanding merit constituting an original contribution on research in engineering materials was awarded to Norman W. McLeod, engineering consultant, Department of Transport, Ottawa, Canada, for his paper on *Application of Triaxial Testing to the Design of Bituminous Pavements.*

The Sanford E. Thompson Award is presented by Committee C-9 on Concrete and Concrete Aggregates for a paper of outstanding merit in the field of concrete and concrete aggregates went to H. F. Gonnerman and William Lerch of the Portland Cement Association for their paper, *Changes in Characteristics of Portland Cement as Exhibited by Laboratory Tests Over the Period 1904 to 1950.* (Reference to the chemical and physical data contained in this paper was made in PIT AND QUARRY'S report of the A.S.T.M. 1951 meeting.)

All of the 36 general sessions were of interest to anyone concerned with construction materials and specifications for them. However, three would have attracted the attention of aggregates producers and users especially, since they dealt with characteristics of concrete, concrete products, mortars, portland cements, bitumens, and the related mineral aggregates. Meetings of committees responsible for these subjects were held during the early part of the week, and the committee reports and technical papers were presented at the general sessions at the end of the week.

Durability of concrete as affected by aggregate characteristics was the subject of a paper by C. A. Vollick and E. I. Skillman, materials engineers, Bureau of Reclamation, Denver. Their discussion was entitled *Correlation of Sodium Sulphate Soundness of Coarse Aggregate with Durability and Compressive Strength of Air-Entrained Concrete.* Coarse aggregates from 70 different sources were subjected to sodium sulphate soundness tests and made into 3- by 6-in. cylinders of air-entrained concrete. The concrete was alternately frozen and thawed until 25 percent of their original weight was lost through deterioration. Comparisons were made of the number of cycles to reach this point, the 28-day compressive strength of similar specimens, the cement content of the specimens, and the sodium sulphate loss after five cycles. As a result of this study it was concluded that statistical analysis indicates a correlation between the freezing-and-thawing durability of air-entrained concrete and the soundness of the coarse aggregate, as measured by the sodium sulphate test. The wide scatter obtained, however, shows that durability is influenced by other factors which are not measured by the soundness test. The study also revealed that in general, durable concrete was obtained with aggregates that showed as much as 32 percent loss in the sodium sulphate soundness test with concretes containing 4 percent entrained air and with a water-cement ratio of 0.51 by weight. Furthermore, it was found that the cement content of air-entrained concretes of equal water-cement ratios did not significantly influence their resistance to freezing-and-thawing action, and that the compressive strength of air-entrained concretes having equal water-cement ratios was influenced by the cement content of the concrete and the soundness of the coarse aggregate, as measured by the sodium sulphate soundness test.

Continuing the session on factors affecting the durability of concrete, under the chairmanship of Stanton Walker, director of engineering, National Sand and Gravel Association, a report was made by Herbert K. Cook, chief, Concrete Research Division, Waterways Experiment Station, Corps of Engineers, Jackson, Miss., on *Experimental Exposure of Concrete to Natural Weathering in Marine Locations.* The report covers more than 2,500 concrete test specimens which have been exposed at four stations (Treat Island, Me., St. Augustine, Fla., Buzzards Bay, Mass., and West Point and Mount

Vernon, N. Y.) to the various natural weathering conditions including alternate wetting and drying in sea water (except in New York). The following are 5 of the 14 important conclusions drawn by the author:

It is of real value to be able to study concrete exposed to either mild or severe weathering for longer periods than can conveniently or economically be done in the laboratory.

The entrainment of properly regulated quantities of air is the most important factor in the improvement of the durability of concrete under severe weathering conditions that has been developed by these investigations. At Treat Island well-made concrete of good quality materials will not ordinarily withstand the exposure for more than one winter unless the concrete contains the proper amount of entrained air.

The use of air entrainment does not protect concrete which contains unsound aggregate.

No definite trends in the effect of curing conditions on durability have been revealed.

The use of cement with a tricalcium aluminate content in excess of 12 percent has resulted in concrete that is non-durable in warm sea water. The use of Type II cement with a tricalcium aluminate content of less than 8 percent appears warranted for such exposure.

Natural weather conditions were also used by W. J. McCoy and S. B. Helms, Lehigh Portland Cement Company, Allentown, in a test of the effect of the five A.S.T.M. types of portland cement, including Types IA and IIA, in concrete of fixed cement content and 3-in. slump. Another group of specimens contained Type I cement from five sources and were maintained at constant W/C ratio but with different slumps. The report, entitled *Performance of Concrete Specimens During 10 Years Exposure to Severe Natural Weathering*, reaffirms the fact that concretes with entrained air show advantages of improved performance. There were illustrations to show the condition of all specimens after the ten-year exposure.

Nondurable concrete due to chemical reaction between certain siliceous aggregates and alkalis released during the hydration of portland cement was the object of a study by R. C. Mielenz, K. T. Greene, E. J. Benton, and F. H. Geier, Bureau of Reclamation, Denver, in their paper, *Chemical Test for Alkali-Reactivity of Pozzolans*. The ability of a pozzolan to control expansion resulting from this chemical reaction is indicated by a newly-developed chemical test. The test correlates well with data obtained on 63 pozzolans in tests of mortars and with the sparse experience with use of pozzolans in construction; it has the great practical advantage of being capable of completion within two workdays. The authors recommend it for use in specifications covering testing and selection of pozzolans for use in concrete.

Under the heading of Concrete, the general session, of which K. B. Woods was chairman, included several papers on masonry mortar and masonry. J. W. McBurney, technologist, National Bureau of Standards, Washington, D. C., discussed the effect of free magnesium oxide in causing expansion and cracking of hardened masonry mortars and walls. From this comprehensive discussion a few observations, conclusions, and recommendations have been selected:

"Accept for use in mortars only those masonry cements and limes which do not exceed 1.0 percent increase in length when tested for expansion according to the A.S.T.M. standard method of test for autoclave expansion of portland cement (C 151-49).

"In the absence of tests, lime should be restricted to type S hydrate or to putty made from high-calcium quicklime. Such a putty should be soaked for not less than 24 hours and otherwise handled as prescribed in the appendix to the A.S.T.M. standard specification for quicklime for structural purposes (C 5-26). The use of unslaked quicklime as an ingredient of mortar cannot be too strongly condemned.

"Costly repairs such as cutting out and repointing of mortar joints should be delayed, if possible, until the hydration reaction has progressed to the stage where further expansion is negligible. Organic caulking compounds for filling cracks are not recommended because the oils in such materials may adversely affect the bond when repointing with mortar or grouting is attempted later.

"Evidence is presented which indicates that many of the observed openings between bricks and mortar joints are not the result of mortar shrinkage but are caused by certain techniques of the mason."

Masonry and concrete is subject to disfiguration or disintegration or both by efflorescence. Dr. F. O. Anderegg, consulting specialist on building materials research, Somerville, N. J., presented an illustrated paper showing examples of both conditions and described the causes of each. He then continued with recommendations for the elimination of the troubles.

Important news for the aggregate and construction industries is contained in the reports of the Technical Committees of the Society. New specifications and new methods for testing materials are developed by committee work. A few of the most recent will be mentioned in this report, although the details would be too voluminous to include here.

Committee C-9 on concrete and concrete aggregates has recommended that methods of test be published as tentative methods for potential reactivity of aggregates (Chemical Test), resistance of concrete specimens to freezing and thawing, and a tentative recommended practice for petrographic examination of aggregates for concrete.

The standard specifications for concrete aggregates (A.S.T.M. Designation: 033-49), recommended for revision, will revert to tentative standards. The revisions are quite extensive, and those who are interested should secure a copy for study. They recognize air-entraining concrete and alkali reactivity.

Committee C-9 has also approved the tentative method of test for potential alkali reactivity of cement-aggregate combinations (C277-50T) which is under joint jurisdiction with Committee C-1 on cement. Standard specifications for lightweight aggregates for concrete (C130-42) will continue without change, pending revision.

Committee D-4 on road and paving materials has published a new tentative specification for crushed stone, crushed slag, and gravel for bituminous concrete base and surface courses of pavements (D692-51T), replacing a specification of the same name which became a standard in 1949. Among the subcommittee activities is that on effect of water on bituminous coated aggregates, C. M. Hewett, Mexican Petroleum Corp., Baltimore, chairman. A summary report of the work to date has been prepared by Mr. Hewett and J. C. Roediger (former chairman of the subcommittee). It makes no recommendation for standardization of any of the methods discussed. A method using radioactive calcium chloride (not mentioned in the above report but discussed in the subcommittee) seems to show some promise.

The report of the committee on cement given by Chairman R. R. Litehiser pointed to recent revisions

in specifications and test methods which, in general, were not of major import to the users. The sponsoring committee on masonry cement, E. J. Wechter, chairman, has been especially interested in studies of autoclave tests, and as a result proposed in the committee meeting that the autoclave expansion after 48 hours of curing be inserted in C-91 and be limited to 1.0%. After much discussion, this recommendation was approved, subject to confirmation by letter ballot of Committee C-1. Further discussion of cement specifications during the Committee C-1 meeting revealed thinking among a number of the members along the lines that the MgO limitation is no longer necessary in C 150 and C 175 since the autoclave expansion test will indirectly provide a limitation. The fineness limitation in the specifications could very well be deleted if the recently-developed bleeding test were used instead.

Standard specifications for gypsum wallboard (C 36-50) have been recommended for revision by Committee C-11 on gypsum, L. S. Wells, chairman, by the addition of requirements for a wallboard thickness of ⅜-in. The flexural strength of this size is to be 145 lb. for bearing edges across fiber of surfacing and 55 lb. for bearing edges parallel to fiber of surfacing. The weight is to be 2,250—3,150 lb. per 1,000 sq. ft. The same tolerances in thickness will apply as for ⅜-in., but if recessed to receive a joint reinforcing strip, the depression for all sizes shall not be less than 0.020 in. nor more than 0.045 in.

Concrete pipe specifications have been recommended for immediate revision by Committee C-13 on concrete pipe, W. W. Horner, chairman, by the addition to the section on reinforcement in both C-75 and C-76, of reference to wire fabric conforming to the standard specifications for welded steel wire fabric for concrete reinforcement (A.S.T.M. Designation: A 185).

Aggregate for masonry mortar as specified in tentative specifications for aggregate for masonry mortar, A.S.T.M. Designation: C-144, is being recommended for revision by Committee C-12, J. M. Hardesty, chairman, by the addition of gradation limits for manufactured sand which permit 20 to 40 percent passing the No. 50 sieve, 10 to 25 percent passing the No. 100 sieve, and 0 to 10 percent passing the No. 200 sieve. The paragraph following the table of grading limits is revised to read as follows: "(b) The aggregate shall have not more than 50 percent retained between any two consecutive sieves of those listed in Paragraph (a), nor more than 25 percent between the No. 50 and No. 100 sieves".

The section on deleterious substances mentions only clay lumps, maximum 1.0 percent by weight, and lightweight particles floating on liquid having a specific gravity of 2.0, 0.5 percent by weight, not applied to blast-furnace slag aggregate. Organic impurities are covered in a new section similar in requirements to the new specifications for concrete aggregates. A section on soundness also has been added, which places limits of 10 percent and 15 percent for five cycles of sodium sulphate or magnesium sulphate, respectively.

Committee C-16 on thermal insulating materials, E. R. Queer, chairman, reported the publication of tentative specifications for mineral wool blanket-type pipe insulation (C 280-51T), and mineral wool molded-type pipe insulation (for elevated temperatures) (C 281-51T). The latter is being considered for further immediate revisions, however. New tentative specifications for cellular asbestos paper thermal insulation for pipes, and laminated asbestos thermal insulation for pipes will be recommended for publication as tentative, as will also methods of test for density of preformed block type thermal insulation, density of preformed pipe covering type thermal insulation, and vibration resistance of preformed thermal insulation for pipes.

Proposed specifications for asbestos-cement pressure pipe have been recommended for publication as tentative by Committee C-17 on asbestos-cement products, H. R. Smoke, chairman. The pipe is intended for use at maximum service pressures of 100, 150, or 200 p.s.i. The requirements include a hydrostatic proof test, flexure proof test, and crushing strength, each of which is detailed in the specifications.

Subcommittees of Committee E-6 on methods of testing building constructions have been active, according to Chairman J. A. Liska, in the revision of E 72 to include the latest testing methods and procedures found desirable to evaluate the strength of housing components, such as the tensile strength of walls and the strength of fastenings at the top and bottom of the walls, since it has been demonstrated that design wind loads cause tensile loads on walls to resist the uplift of the roof. The subcommittee on sound transmission which promulgated the present tentative recommended practice for measurement of air-borne sound transmission loss (E 90-50T) has begun work on a tentative method for the measurement of sounds due to impact.

Practically everyone is interested in engine anti-freezes, and the report of Committee D-15 on this subject, H. R. Wolf, chairman, contains a reference to an excellent general-interest article on the *Selection and Use of Engine Anti-freeze* which accompanies the report. The purpose of the article is to provide consumers with practical information and advice on engine cooling system anti-freezes and corrosion inhibitors. Other cooling system products, such as cleaning compounds and stop-leaks, are also discussed. Subcommittee VII of Committee D-15 has prepared a general outline form for an anti-freeze performance specification using the existing test methods and those being developed in the other subcommittees, but this is still dependent upon the projects under investigation by the other subcommittees to provide the necessary information for the specification limits.

Slag Assn. Directors

(*From page* 78)

cluding the two trophy winners, operated throughout the entire year without a lost-time accident. These plants operated a total of 907,086 man-hours, or 26 percent of the 3,516,764 man-hours operated by all the enrolled plants.

The Bureau of Mines was represented at the luncheon by Seth T. Reese, chief of the accident analysis branch, who discussed some of the over-all results of the industry's 1951 safety competition. Mr. Reese urged plant operators to do everything in their power to anticipate and eliminate the safety hazards which result in lost-time accidents. Only thus, he said, can the industry turn out a product unstained by the blood of its employees.

Among the highlights of the two-day meeting was an inspection tour of the 500-t.p.h. slag plant of the Edward C. Levy Co., one of the largest operations of its kind in the country. The party also visited the blast furnaces and slag pits of the nearby Ford Motor Co. plant, which furnishes material for the extensive operations of the Levy Company. Of particular interest to the directors and their wives was a tour of the final assembly line at the Ford plant, where they saw finished automobiles turned out at the rate of one every 56 seconds.

WASHINGTON NEWS LETTER

By S. HERBERT UNTERBERGER

NOW that Congress has completed its business, it is finally possible to total the amount which it has authorized the various agencies to spend—and the amount is enormous. It will be remembered that when the President presented his budget around the beginning of the year, Congress went through its usual performance of bewailing the "unnecessary and excessive" expenditures; and in the succeeding months there were many strong speeches and newspaper articles, all of which gave the general impression that Congress was going to cut military and foreign aid spending drastically. However, this year again Congress has repeated the process of talking drastic economy and then appropriating more money for defense than can be spent.

During the last fiscal year, which ended June 30, 1952, we were surprised to discover that actual spending of $66,000,000,000 was $4,000,000,000 less than had been expected. For the current fiscal year the government expects to spend around $85,000,000,000. Around Washington, however, it is being freely predicted that it is unlikely that more than $80,000,000,000 actually will be spent. Nevertheless, this is $14,000,000,000 more than was spent last year—an increase of more than 20 percent. In so far as business prosperity is related to government expenditure, Congress has assured a continued high level for another year, at least.

This is how the orders for military equipment and foreign aid are likely to be distributed. The armed forces will have almost 60 percent of the money to spend. They will spend more in the current fiscal year than they have in the last for guns, tanks, ships, airplanes, and other "hard goods". They will spend about the same amount on goods which are quickly consumed, such as food, clothing, and fuel. Defense construction is expected to increase substantially. During the new fiscal year defense construction contracts are expected to increase to $4,500,000,000 from last year's high of $2,700,000,000.

Another area of large construction demand is the atomic energy program. The Atomic Energy Commission expects to increase its spending from $1,600,000,000 to $1,800,000,000. Practically all of the increase, plus a large part of the basic amount, will go for new construction. A great deal more would be spent if the necessary materials were available.

In general it may be expected that the demand for building materials generated by direct government expenditures will continue and even increase. In addition, defense expenditures have generated a demand for construction on the part of the industries which are supplying the government's requirements. Ever since the beginning of the Korean crisis the demand for new plants and equipment has been rising. On the basis of reports just released, it appears that the expenditure for new plant and equipment will continue upward through the third quarter of this year.

However, there has been a noticeable change in the industrial pattern of these new capital outlays. In the early post-Korean period capital outlays boomed in the metals producing and fabricating industries. That phase of the expansion has leveled off and is due to decline. The expanding programs now are found in the electric power, petroleum, chemicals, and rubber industries.

Scheduled capital outlays by electric power companies are one-fourth above the outlays toward the end of 1951. Electric companies received one-third of all the certificates of necessity issued in the first two months of 1952. The oil companies have also received many certificates of necessity, both for pipeline expansion and for increased refinery capacity. The chemical industry has also received about 10 percent of the certificates of necessity issued so far this year.

A large part of the capital outlays in these booming industries will be devoted to new construction. Furthermore, the railroads are also expected to increase the amount they spend for new construction, even though their total capital expenditures are not due to increase.

Increased expenditures such as those discussed above generally result in increased income to all economic groups—employees, business proprietors, property owners, stockholders, etc. On the other hand, increased expenditures generally call forth increased tax rates by which the government recovers part of the increased income. There are many opinions on how these increased taxes impinge on the incomes of the various economic groups. Recently official data were released which throw some light on the question. Private incomes before and after taxes are compared for each of these groups in 1929 and 1948. A comparison with 1951 would be more enlightening, but it is not yet available. The data are shown in the accompanying table.

The table below shows some very interesting and even startling relationships. It may be seen that total private income increased 160 percent before taxes and 128 after taxes. But the increases for the various groups differed from this overall relationship. Farm income and corporate profit increased more than 200 percent before taxes. After taxes farm income still increased by 200 percent, but corporate profit increased by less than half that much. After taxes, compensation of employees and business and professional incomes increased substantially more rapidly than corporate profits. The table also shows that rental income and income derived from interest fared worse.

It is almost certain that when those data can be extended through 1951, the contrast between income changes before and after taxes will be even greater.

	Private Income Before Taxes			Private Income After Allocable Taxes		
	1929 Billions	1948 Billions	% Increase	1929 Billions	1948 Billions	% Increase
Compensation of Employees	$50.9	$142.4	179.8	$50.6	$127.6	152.2
Income of unincorporated enterprises:						
Business and Professional	8.3	22.1	166.3	8.1	19.3	138.3
Farm	5.7	17.7	210.5	5.7	17.1	200.0
Rental Income	5.8	7.5	29.3	5.8	7.1	22.4
Corporate Profits	10.3	31.7	207.8	8.6	17.1	98.8
Interest	7.5	8.8	17.3	7.4	8.5	14.9
Total	$88.4	$230.1	160.3	$86.2	$196.7	128.2

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A view of the plant of the Société des Ciments de Lafarge et du Teil, 30 miles from Oran, Algeria.

Lafarge's Saint-Lucien Plant

By J. G. WALTER
EMMISA, Paris, France

AN outstanding achievement of French - American technical co-operation found its expression in the latest addition to the plants of the large French cement manufacturer, the Société des Ciments de Lafarge et du Teil. This new plant, Saint-Lucien, was added to the 10 plants owned by the concern in the metropolitan territory of France which produce yearly about 8 million barrels of cement.

The concern had envisioned long before World War II that an extensive development was going to occur in the north African territories and it had planned to set up a new plant for serving the growing local markets. A subsidiary was founded, the Société des Ciments Artificiels d'Oranie, to manage and operate the plant, which was erected in a desert location, near Saint-Lucien, about 30 miles from Oran, Algeria.

The plant site was chosen because a geological bed of heterogeneous limestone and clay was of easy access. There was a reserve of 5,500,000 short tons of stone of low magnesia content. Furthermore the limestone lay over a clay substratum covering deep waters. Consequently there was easy access to water in a desert almost deprived of it; this site was definitely selected for all these conveniences.

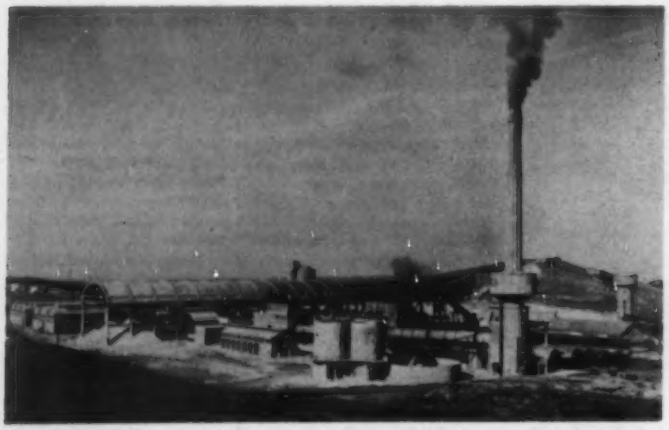
The plant has been designed for a production of 720,000 bbl. per year of cement, by wet operation. The plant layout was drawn taking into account future extension, and room was left for adding two or more kilns with the corresponding grinding units in order eventually to produce up to 3,000,000 barrels of cement. Engineering and layout were made by the technical staff of Lafarge in Paris (France), applying the experience gained in the operation of their other plants over more than a century. Lafarge personnel themselves chose the equipment and relied upon the manufacturers only for suggestions on automatic control and interconnection.

The plant was to be highly mechanized because skilled labor had to be imported from France. Consequently the newest techniques were applied for reaching an efficient productivity, and modern machinery was used.

It might interest the American reader to know that this plant presently consumes yearly:

33,000 to 38,000 short tons of coal, 200,000 short tons of raw material out of which are processed 720,000 bbl. of cement in the average, 10 to 12 million kw.-hr. 150,000 cubic meters (5,350,000 cu. ft.) water.

The first stone of the plant was laid in December, 1946, and 1,650,000 cu. ft. of earth were moved for setting the foundations. In June,



Another view of the Saint-Lucien plant. In the foreground are the slurry tank and the two raw-mix storage tanks. In the rear (right) is the water tank and (in the distance) the quarry.

Newest North African cement plant in Saint-Lucien, near Oran, Algeria

1947, the concrete buildings were almost completed. Used in the building of the plant were: 90,000 bbl. of cement, 4,500 short tons of steel structures, 142,000 cu. ft. of woodboards for the patterns, 2,000,000 man-hours labor of all trades. In the middle of 1949 plant and dwellings were completed and by March, 1950, the official start of the plant was made. By the end of 1950 it had already produced 670,000 bbl. of cement, or 94 percent of the rated yearly capacity.

The isolated location of the plant required a high degree of mechanization and a high class of skilled labor. To have this labor come and work in Saint-Lucien, the Lafarge concern had to erect a new city. All this made the enterprise a very costly one. At the end of this article the social aspect of the efforts of Lafarge is mentioned, and the considerable efforts undertaken by France to equip this underdeveloped area are shown.

Quarry Operations

The cement plant has been erected close to the raw material deposits. The geological formation is a hill of stratified limestone in several layers, each layer having a different composition. Correct mixing of the layers gives a raw mix almost ready to be burned to clinker. The limestone quarry opened a large front in the hill, and the stone is taken from various places according to the needs of the plant. The limestone contains a high silica percentage, so the clinker obtained is very corrosion resistant, due to a low alumina content (less than 4.5 percent). This quality is very much appreciated in that region, for most cements are used in the building of maritime port works, and the concretes have to be resistant to seawater. The clinker obtained in Saint-Lucien is one of the best of North Africa, and the cement produced finds expanding uses in the ports on the north African beach or in the building boom in southern Algeria, near the Sahara, where soils are chemically active and concrete has to be extremely corrosion resistant. The Société des Ciments d'Oranie has just been awarded governmental recognition for the suitability of its cement, and this also will increase the markets.

The limestone quarry is cut into four layers of stone. Equipment was selected for operating six days a week, one shift a day. Average tonnage handled in the quarry reaches 100 t.p.h. The equipment used include two Model 22-T Bucyrus-Erie drills for deep drilling 6-in. diameter holes, one movable Ingersoll-Rand air compressor, one 2½-cu. yd. Marion electric shovel with Ward Leonard drive, and three shovels of smaller dipper capacity, and three Easton model TR-10 semi-dumpers capable of 10-ton loads.

The clay pit, adjacent to the limestone quarry, is operated continuously. A ¾-cu. yd. dipper shovel serves for loading the clay in the trucks.

Crushing Operations

Limestone and clay are brought alternately to the crushing plant in a ratio near the correct proportion for preparing the raw mix. The run of quarry rock is fed directly into a 42-in. Superior McCully gyratory crusher of Allis-Chalmers make, set at 6-in. open side setting. Crushed product is conveyed to two 5- by 12-ft. Allis-Chalmers Ripl-Flo vibrating screens which size at ½ in.; the oversize is conveyed to a Pennsylvania C 1550 Impactor in closed circuit with the screens. The Impactor is driven by a 400-hp. motor. The finished product of minus ½-in. is conveyed to the storage hall. Transport of stone is done by Robbins belt conveyors.

Storage Hall

The storage hall covers a space of about 6,500 sq. ft.; it measures 590 ft. by 98 ft. and it is entirely covered. Two P&H cranes serve it, each having a 10-ton carrying capacity. Clinker is stored in the middle space, the raw stone on the end near the quarry, and the coal on the opposite end.

Raw Mix Grinding

The raw materials—clay and limestone of different composition—

This shot shows the limestone quarry, with shovels, trucks, and drills.

A part of the crushing plant, with material discharging over the 42-in. primary gyratory crusher.

are taken by crane from the storage and fed into bins over two 72-in table feeders. These feed the raw grinding mill, an 8- by 40-ft. Allis-Chalmers three-compartment Compeb mill in open circuit, operating wet. The mill is driven by a 1,000-hp. motor, and the feeders by variable-speed d.-c. motors.

The raw-grinding section works on a 55-short-tons-per-hour basis on the average, 8 hours per day and 7 days a week. Ground slurry is pumped by two 4-in. Wilfley pumps into four Dorr slurry tanks set at about 30 ft. above the ground level as seen in the pictures.

Blending

The four slurry tanks are blending tanks provided with Dorr agitating and air devices. Each tank has a capacity of 16,000 cu. ft. and a C 120 Fuller rotary compressor supplies the air. The tanks are fed with slurries of different composition, and four Wilfley pumps serve to move slurries from one to the other for blending purposes. Slurries then are fed by gravity into two storage and mixing tanks for building up the definite mix. Each of these tanks has a capacity of 36,000 cu. ft. Two 4-in Wilfley pumps move the finished mix to the kiln.

Burning

The slurry at 32/34 percent water content is fed by a ferris-wheel into an Allis-Chalmers 11½- by 350-ft. six-support rotary kiln. This kiln has single drive and a 150-hp. motor; it turns at an average speed of 1 r.p.m. and a synchronous tie links feed rate to kiln speed. The kiln was built of 16 sections riveted together. It has an air-cooled discharge end, as have all new Allis-Chalmers kilns. The burning philosophy of the Saint-Lucien people is to keep the speed constant and to vary the other factors like feed rate, air rate, coal rate, etc.

Hot clinker is cooled into a 7- by 44-ft. inclined grate Fuller air-quenching cooler. Hot air is recuperated. Cooled clinker has an average temperature of 30-deg C. above ambient and is discharged to the storage hall by a chain conveyor.

The control panel was designed by Lafarge. It permits operating the burning department from one spot. The highly developed instrumentation on this kiln, contains the following: Leeds and Northrup measuring and recording meters for speed, temperatures, volume of air and gas, and temperature of kiln shell. Pressures are recorded by Brown meters, and thermocouples record burning zone temperature. The control panel also has meters indicating the oxygen content of the gas, and signaling lights for smooth operation of each machine of the burning department. Motors of blowers, exhausters, kiln, coal and raw mix feed are of the variable type, permitting accurate adjustment.

Coal Preparation

The r.o.m. coal comes from the Morrocan mines of Kenadza and Colomb-Béchar and are transported by rail. The gondolas are discharged by clamshell and the coal is stored in the storage hall. Taken from there it is fed by a 72-in. table feeder to an X 418 Hardinge rotary dryer measuring 104 in. by 65 ft. Dried coal goes directly from the dryer to the Kennedy-Van Saun 8- by 15-ft. air-swept ball mill driven by a 350-hp. motor. Ground coal is air-pumped by a 7-in. Fuller pump into a storage bin placed ahead of the kiln.

Cement Grinding

The cooled clinker is stored in the hall and from there fed to the cement grinding. Originally there was only one cement grinding mill, but increasing needs of local markets soon required the addition of a second mill. Both are fed by table feeders. One mill is an 8- by 40-ft. Compeb mill made by Allis-Chalmers, driven by a 1,000-hp. motor, and the other is an F. L. Smidth mill, also driven by a 1,000-hp. motor, which was purchased in Europe.

There is no pregrinding of the

The 8- by 40-ft. compartment mill used for raw grinding. Note the use of concrete in the construction of the building.

The city under construction, showing the homes being built for the personnel. Lafarge also erected administrative facilities, churches, medical and merchandising setups, and even a community swimming pool.

clinker in a gyratory crusher, but it is planned to improve this stage of operation. The finished cement is air-conveyed through two 7-in. Fuller C 120 pumps to the cement storage silos.

Cement Storage and Packing House

Each of the three 15,000-bbl. storage silos feeds a St. Regis 150 F-C packing machine with four loading nozzles. Filled bags fall onto conveyors and are loaded either in trucks or railroad cars. Dust is collected by a Norblo dust collecting system and reconducted into the silos.

Miscellaneous

A very modern laboratory permits accurate control of all stages of operation. Samples are taken at each stage for control purposes and submitted to tests in order to have the feed to the kiln as constant as possible.

Due to the isolation of the plant special care was given to the repair and maintenance of the machinery. Most of the repairs can be handled in a special shop tooled with lathes, forges, etc., which can take care of any break-down and obviate shutdown of the plant. In addition, a repair shop for passenger cars had to be included in the plant because of the use of private cars for transportation of the working people.

A very difficult problem would have been the water supply; but with the geological deposit selected it was necessary to drill only 200 ft. and to build a gallery for conducting the piping. Water is stored in a 36,000-cu. ft. water tank and is supplied in sufficient amount to cover the needs of the plant, as well as those of the city.

Electric power is purchased from the Algerian power supply company. It comes in at 60,000 volts, and is transformed to 5,000 or 380 or 220 volts, as needed. Current is 50-cycles, as in common practice in western Europe and Africa. The 5,000-volt current is used without transformation in the grinding departments, the 380 feeds most of the motors, and the 220 is converted to d.c. for the variable-speed motors.

Social Development

Since there was nothing but a desert in Saint-Lucien before the erection of the plant, the Lafarge concern had to include the expenditures of a new city with administrative facilities, churches, medical services, merchandising organizations, leisure and sport facilities. The city had to supply homes for Frenchmen, as well as for local Arabian labor, and there was no discrimination made in the housing erected for the French and the Arabians.

The illustrations show the extent of work undertaken since 1946 and prove that great care was given to insure a comfortable living for the people. Even a swimming pool was provided.

The erection of a plant and its adjacent dwellings required a heavy investment, exceeding by far the average costs of installing a plant in

(*Continued on page* 91)

A closeup view of one of the company houses, modern in every detail, available to French workers and Arabians alike.

Interior of one of these houses, completed about the middle of 1949, a part of the modern community built in the North African desert.

CANADIAN

Crushed Stone Plant

Built to HELP SELL CEMENT

Simplicity of Design and Dust Collection Are Features

By WALTER E. TRAUFFER

another ON THE SPOT report

THE Canada Cement Company has an enviable reputation in the portland cement industry as the operator of some of the most modern and efficient cement plants in existence, and one of its seven plants also ranks among the largest. This reputation has been earned by the company partly as the result of improvement programs at these plants involving the expenditure of many millions of dollars in recent years. Its competent and experienced operating and engineering staff must also be given much credit.

It was not surprising, therefore, that when the company early in 1949 completed a new crushed stone plant to serve the Ottawa, Ontario area, this should be an outstanding operation combining simplicity with efficiency and economy of operation. It has a capacity of 1,500 tons in 8 hours and is operated on a 5-day, 48-hr. week basis with a crew of only 17 men, including supervisory personnel.

In common with many other cement manufacturers Canada Cement also produces commercial crushed stone at some of its cement plants as a logical sideline. This was the case with its plant near Hull, Quebec, which is across the Ottawa River, north of Ottawa. It was decided several years ago to conserve the stone at that location for cement manufacture, and rather than to give up the nice volume of crushed stone business that had been developed, it was decided to build this new plant 6 miles east of Ottawa. There was also a shortage of crushed stone producing capacity in the area, and this added output was helpful to the company's cement customers and to its cement sales. This plant is operated as Ottawa Valley Crushed Stone Ltd. under the general supervision of D. A. Gasper, superintendent of the Canada Cement Company's Hull plant. G. G. Quirk is quarry superintendent, and R. G. Bullis is foreman.

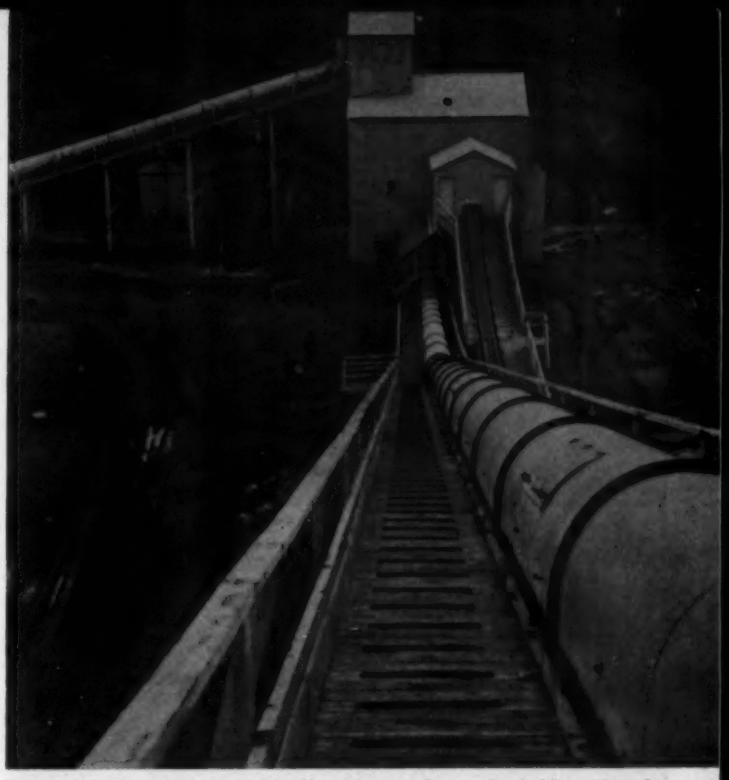
The property was farm land, and the quarry had to be developed from scratch. The overburden is light and is removed by a shovel, a bulldozer, and trucks well in advance of

General view of the Ottawa Valley Crushed Stone plant, showing primary and secondary crusher buildings (right), and office and shop (left).

quarrying operations. The deposit is Trenton or Black River limestone and may be a mixture of both formations. The quarry was originally opened on what is now a 25-ft. lower level; but this made the face higher than was desirable, so only the upper level is now being worked.

The present quarry face averages about 45 ft. in height, and blast holes are drilled 2 ft. below the floor with two well drills—a Bucyrus-Erie and a Loomis—both equipped with 6⅝-in. bits. Holes are drilled with 12 to 13 ft. burden and about the same spacing. Single row shots are made using an average of 150 lb. of 5- by 16-in. polar Forcite (Canadian Industries Ltd.) 50 percent gelatin per hole. Primacord and electric caps are used. The last 12-hole shot brought down 8,700 tons of stone. Blockholes for secondary blasting are drilled with jackhammers. Air for these drills is provided by an Ingersoll-Rand 210-c.f.m. portable compressor.

A Dominion 500 electric shovel with a 2-cu. yd. dipper is used for loading and an older Bucyrus-Erie 50B shovel with a 1⅝-cu. yd. dipper is kept in reserve. An Allis-Chalmers HD10 tractor-bulldozer is used to clean up the quarry floor, which is very smooth and nearly level. Two Euclid 15-ton end-dump trucks—one with a Cummins and the other with a General Motors diesel engine—haul the stone about 1,000 ft. down a slight grade to the plant. There they back up to dump onto a 48-in. by 10-ft. 6-in. manganese steel apron feeder which has start and stop pushbuttons to control the feed to the 48- by 60-in. Traylor Bulldog primary jaw crusher. The crusher is driven by a 250-hp. 600-r.p.m. motor through a flat belt drive. A Northern overhead crane with an electric hoist is used for handling equipment. A Provincial Engineering 5-ton electric hoist operates a stone hook.



Looking down the main conveyor (No. 2) at the secondary crusher building. Note the metal housings over the conveyors, also protruding grease fittings.

The minus 6-in. product is discharged on a 30-in. by 200-ft. Jeffrey belt conveyor (No. 1) with Goodyear belting and a gravity take-up. In the secondary crushing building the stone is discharged into a surge hopper from which it is chuted into a secondary crusher. Hanging bars in the chute slow down and even out the flow of stone. The Symons 4¼-ft. standard cone secondary crusher is driven by a 150-hp., 900-r.p.m. motor through V-belts. The product of this crusher is carried on a 24-in. by 293-ft. belt conveyor (No. 2) to the top of the screening building, which is mounted on six 17-ft. dia. by 32-ft. high concrete silos each with a live reclaimable capacity of 300 tons.

The screening is done by two 6- by 12-ft. Dillon 2-deck screens

The bag-type dust collector, with the large pipe from the screens and the pipe in the foreground to the reduction crusher.

One of the two 15-ton heavy-duty end-dump trucks discharging its load to the primary crusher.

The No. 2 6- by 12-ft. 2-deck screen with the discharge chute to the silo in the foreground.

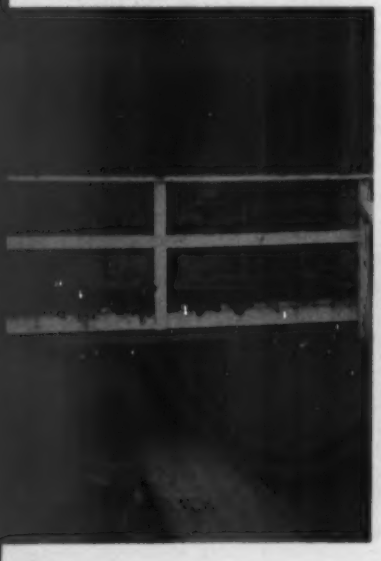
The 2-cu. yd. electric shovel in the quarry and the two churn drills cease operations temporarily during a rainstorm.

The screening and storage building, with dust collector, reduction crusher, and return conveyor (right).

and a similar 1-deck screen in series, each driven by a 5-hp., 1,200-r.p.m. motor through V-belts. The No. 1 screen has 1½-in. openings on the top deck and $1\frac{3}{8}$-in. on the bottom deck, the No. 2 screen has ⅞- and $\frac{7}{16}$-in. openings and the No. 3 screen has ¼-in. openings for winter operation and ⅜-in. in summer.

The 1½-in. stone off the bottom deck of screen No. 1 is chuted direct to silo No. 2. The material through the bottom deck of this screen is carried on a short belt conveyor (No. 3) to screen No. 2. The 1-in. and ⅝-in. sizes off the decks of this screen are chuted to silos No. 3 and 4. The material through the bottom deck of this screen is carried on a short belt conveyor (No. 4) to screen No. 3. The ⅜-in. product off this screen is chuted to silo No. 5, and the fines through this deck go to silo No. 6.

The oversize—plus 1½-in.—off the top deck of screen No. 1 is chuted into one half of silo No. 1, which is divided. No rail shipments are made and there are two gates and chutes under each silo for truck loading. There is a railed-in loading station for each pair of silos. At each station four levers operate the inverted arc gates which have spreader chutes for distribution of the loads in the trucks. The oversize stone is seldom loaded out, however; it is usually fed by gravity to a 3-ft. Symons short head cone crusher driven by a 75-hp., 1200-r.p.m. motor through V-belts. This is usually set at 1-in. opening, and a 24-in. by 215-ft. horizontal belt



The two lever-operated arc gates under one silo. Note the safety platform from which the operator can serve two silos.

Left: The 48- by 60-in. jaw primary crusher which reduces stone to 6-in. minus.

Right: The standard cone reduction crusher which reduces oversize from the screen. Note the dust collector connection.

conveyor (No. 5) carries it back to the main conveyor (No. 2) for re-screening.

This plant is kept as nearly dustless as possible by means of a Sly bag-type dust collector which is connected to a suction head at each of the three screens. A B. F. Sturtevant Size 95 Silentvane fan provides the suction. This collector was installed primarily to improve working conditions but it has paid for itself through the dust collected. The dust is discharged into the other half of silo No. 1. It is loaded out into trucks and sold as agricultural limestone, for which a demand is developing in that area.

All truck shipments are weighed on a 20-ton Fairbanks scale. An International 5-ton truck is used for stockpiling and a 170,000-ton storage was built up during the winter as the plant is operated whenever the weather permits. A Bucyrus-Erie 10B shovel is used for rehandling from stockpiles to trucks.

The plant has an interlocking control system which shuts down the entire operation when one unit fails. Starting is automatic in reverse sequence. The exposed belt conveyors are enclosed with arched sheet metal covers having angle iron sections bolted to the conveyor frame. Grease nipples protrude, and occasional doors give access to the belt conveyors. A garage and repair shop handles maintenance and minor repairs of equipment.

Aggregates at Albeni

(*From page* 73)

or to open storage. None of the gravel is crushed.

The concrete plant, a C. S. Johnson Octobin installation with 315 cu. yd. of aggregate-bin storage, is located close to the spillway. The bins are loaded by a 24-in. by 280-ft. conveyor, loaded trucks from the aggregate plant dumping into a hopper at the tail pulley. Two 2-cu. yd. Smith tilting mixers, mounted below the batching floor, prepare the concrete. Bulk cement, Type II, comes in by rail from the Metaline Falls, Wash., plant of the Lehigh Portland Cement Company and is stored in a 2,700-bbl. silo alongside. The cement bin in the plant proper can contain an additional 330 bbl.

Concrete production is at the rate of 60 cu. yd. per hr., and pouring in the summer is confined to the cool hours of the night as there is no provision for the cooling of the mass concrete by piping or other artificial means.

Al R. Bacon is project manager and W. L. Davis Jr. project engineer, for the contractor. J. E. Grafton is resident engineer for the Army Engineers.

Lafarge's Saint-Lucien Plant

(*From page* 87)

a region already civilized, and provided with transportation means. The French did not hesitate to spend whatever was needed and did not spare any efforts for equipping this outpost of the Western civilization. The Saint-Lucien achievement can be taken as one example, among plenty, of what France is doing in the African territories in order to improve the standard of living of the population and to raise the economic status from the Middle Ages to the modern way of life.

The writer calls the attention of the American reader to the difficulties encountered when equipping territories such as North Africa. There are almost no communications, and most of the territory is desert. The population is nomadic and unstable, as there is no water except underground. To these specific economic weaknesses is to be added something unknown in the States: the Islamic philosphy and state of mind of the population, which is opposed to settling down and to working in our manner. One finds in North Africa a general indifference toward modernization and industrialization; that is why any European concern trying to operate in Africa has to bring in with the equipment the labor to operate it, making it costly to run a business under such conditions. It is not so much a matter of different races but a matter of mind and attitude that separates the Continental European from the African Arabian.

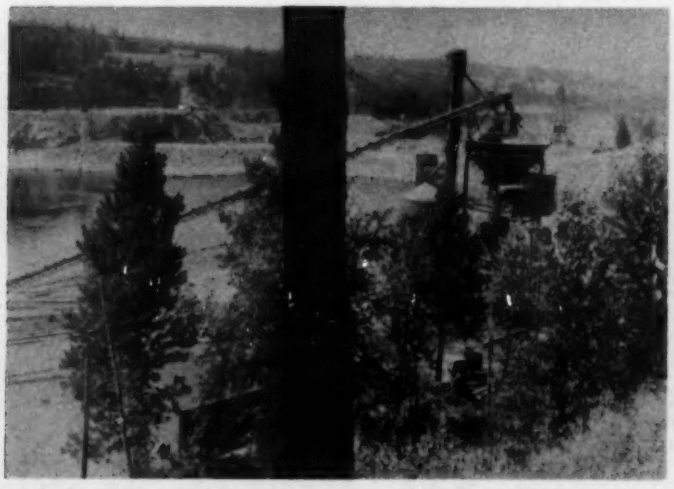
Consequently, whenever a great project is achieved in North Africa, one can say that the pioneers who undertook it deserve great merit.

Acknowledgments

Indeed, the achievement of Saint-Lucien would not have been possible without the loans granted by the United States to France in 1946 and without the Marshall Plan. Thanks to this generous help, France could purchase basic equipment in the States at a time most of the European industries were still in ruins and unable to do anything but repair their own scars of war.

In addition, on another side, credit must be given to the very able and distinguished technical manager in Europe of the Allis-Chalmers Manufacturing Company, Mr. F. Rey, for having brilliantly introduced American techniques and know-how among leaders of the French cement industries. It is to his special credit that the Saint-Lucien plant was equipped with modern machinery and supplied with the newest techniques.

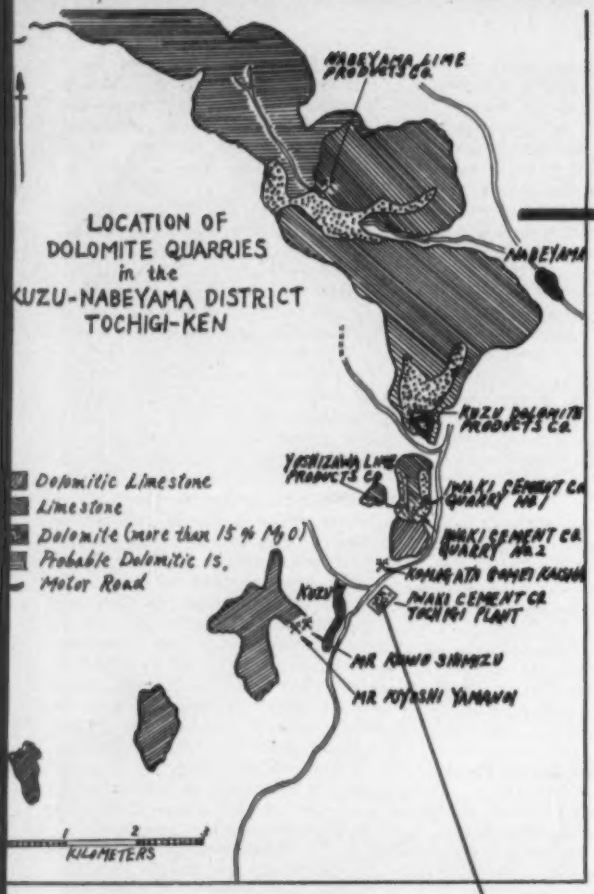
Information for this article was graciously given to the writer by the Société des Ciments d'Oranie and to the *Revue des Matériaux*, which published in its July, 1951, issue an article on the same plant. The writer wishes to express the best thanks to them.



• Looking over the Albeni Falls Dam construction site, showing the 280-ft. conveyor which carries aggregates to the batching-and-mixing plant.

Japan

DOLOMITE CLINKER



Location (above) and overall view (below) of the Iwaki Cement Company's Tochigi Plant.

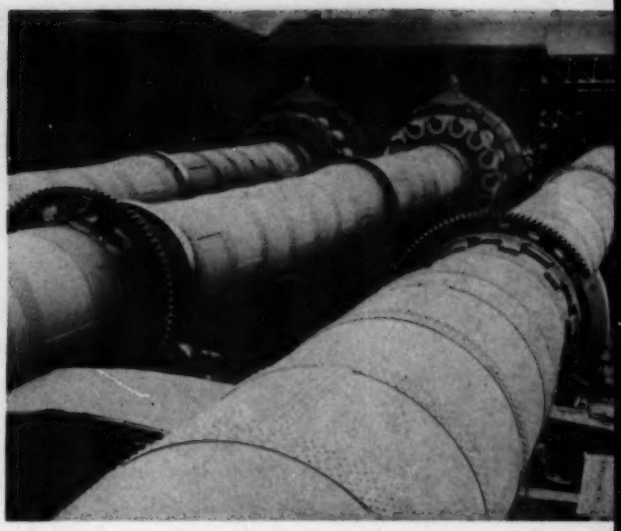
IN THE past almost all the magnesite used as basic refractories in iron and steel furnaces was imported from Korea and Manchuria, and the Japanese were forced to develop a refractory from domestic sources when imports of refractory magnesite from the above sources were greatly curtailed. The production of dead-burned dolomite in Japan started in 1943.

Dead-burned dolomite clinker which has not been treated in some manner to reduce the free lime content is a poor refractory, and the Iwaki Cement Company attempted to solve the problem with a patented process by calcining in a rotary kiln. The company began the manufacture of clinker in May, 1944, and ceased production in August of the same year.

The company continued its research, and again began production in March, 1949. Up to the present time it has produced 4,000 metric tons. This clinker has been used as basic refractory in iron and steel furnaces.

A solution to a domestic refractory problem, typical of Japanese efforts to recover industrial and economic stability

By YOSHAIKI SANADA

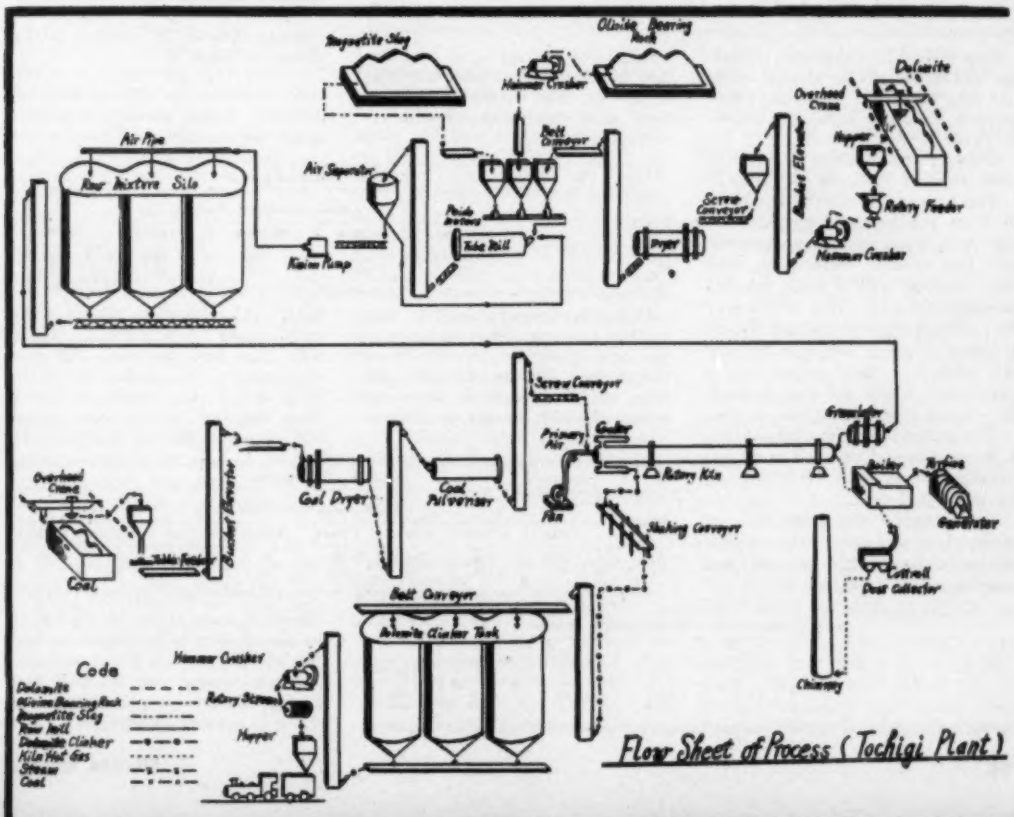


The rotary kiln is 70 m. in length by 3.3-3.75 m. in diameter.

The Tochigi plant of the Iwaki Cement Company is located in the Kuzu-Nabeyama district, which is the only important source of dolomite ore in Japan. The Kuzu-Nabeyama district is situated about 65 miles north of Tokyo in Tochigi Prefecture. The known reserves of dolomite suitable for use as a refractory material are estimated to be about 40,000,000 metric tons, of which 34,000,000 metric tons lie in the Kuzu-Nabeyama district. This area is the only one in Japan which produces dolomite analyzing at least

Table 1. Chemical Composition of Raw Material

Kinds of raw material	Ig. Loss	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	TiO_2	Total
Dolomite	46.75	0.40	0.21	0.09	33.84	18.53	.....	99.82%
Olivine-bearing rock	3.60	38.60	4.37	7.83	1.50	44.32	.....	100.22%
Magnetite slag	0.10	3.60	1.60	79.84	0.81	2.10	12.05	100.00%



Left: Granulator in which mix is turned out in lumps of about 10 mm. in size.

Above and below: Microscopic protographs of clinker.

18 percent magnesium oxide and less than 1 percent silica. Locations of dolomite quarries in the Kuzu-Nabeyama district are shown in the accompanying map.

Particle size distribution of dolomite clinker is shown in Table 3.

Dolomite clinker having 2-10 mm. particle size was weathered at the condition of average room temperature 20 deg. C., relative humidity 65 percent. The residue of 1.5 mm.-mesh sieve was measured with results as follows:

Table 2. Chemical Composition of Finished Clinker

Kinds	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	TiO_2	Total
C_1	3.38	2.62	5.60	57.70	30.25	0.50	100.05%
C_2	3.68	2.40	6.14	57.48	29.85	0.53	100.08%
C_3	4.31	2.47	5.84	56.69	30.54	0.47	100.02%

Raw materials of dolomite clinker are dolomite, olivine-bearing rock and magnetite slag. Chemical composition of the raw material is shown in Table 1.

Chemical composition of the finished product is shown in Table 2.

The technology of our process is to crush dolomite and olivine-bearing rock separately in a hammer and jaw crusher respectively, and then combine with a small amount of magnetite slag. This mix is sent to a compartment pebble mill. Water is added to insure homogeneity, and the product is then passed into a granulator, where the mix is made into lumps of about 10 mm. in size.

The material is then charged into a rotary kiln and calcined at a temperature of at least 1600 deg. C. by pulverized coal.

For example, the proportion of material is dolomite, 93 percent; olivine-bearing rock, 5 percent; and magnetic slag, 2 percent.

Table 4. Weathering Test

Kinds	1.5mm.-mesh Sieve Residue (%)				
	10 Days	30 Days	50 Days	70 Days	90 Days
K_1	100	100	100	99	98
K_2	100	100	100	99	97

Dolomite clinker having 2-10 mm. particle size was slaked in water at the atmosphere of average room temperature 20 deg. C. The residue of 1.5 mm.-mesh sieve was measured, with results as follows:

Table 5. Slaking Test

Kinds	1.5mm.-mesh Sieve Residue (%)							
	1 Day	3 Days	5 Days	7 Days	10 Days	15 Days	20 Days	30 Days
K_3	100	100	95	90	86	80	70	62
K_4	100	100	97	92	88	83	73	65

Table 3. Particle Size Distribution of Clinker

20mm. (%)	20-15mm. (%)	15-10mm. (%)	10-5mm. (%)	5-2.5mm. (%)	<2.5mm. (%)	Total (%)
3.9	6.9	19.7	39.9	23.0	6.6	100.0
5.4	7.5	19.2	42.3	18.6	7.0	100.0

Refractoriness of clinker is as shown in Table 6.

(*See page* 121)

By observing a thin section of dolomite clinker through a microscope, we obtained the following results: (1) Dolomite clinker minerals consist of $3CaO \cdot SiO_2$, $2CaO \cdot SiO_2$, free lime, periclase, and iron compounds; (2) clinker richer in SiO_2 and Fe_2O_3 content is larger than the size of periclase crystal and more stable in slaking; (3) clinker is more stable in slaking, if its constitution is homogeneous and the periclase crystal shows uniformity, even though low in SiO_2 and Fe_2O_3. Microscopic photographs are

(*Continued on page* 121)

MODERN DESIGN PRINCIPLES IN PYRO-PROCESSING

PART II—KILN SYSTEMS (Continued)

Factors Controlling Scaling, Balling, and Ringing in Rotary Kilns

WOLF G. BAUER
Consulting Engineer

another P-Q exclusive

EVERY kiln operator who must master the operational problems connected with pyroprocessing materials to and past the incipient fusion point has a real stake in any and all practices, designs, and techniques that will tend to smooth out the operation, help him to maintain more uniform production and product grade, and inhibit the formation of balls and large agglomerations, lining scale growth, and ring build-up and constrictions.

Fusion begins with softening and melting of the lowest-melting-point constituent or mineral in a kiln charge particle, or an added fluxing agent. Kiln charge particles being original pieces of crushed ore, or artificially compounded pieces of briquetted, caked, or granulated material, this incipient fusion process may vary widely in its mechanics, as well as in its degree. We use the term "incipient" to denote early or first fusion or melting. Actually, the kiln charge particles of crushed ore or agglomerated material may be in all stages of fusion, fluxing, melting, softening, deformation, shrinking, expanding, frothing, crystallizing, or hardening with little or most of the constituent mass in a glass or liquid state.

Coarse-Crushed and Sized Ore Under this classification kiln charge particles are compact, crystal or grain bond is strong and unbroken, and porosity is minimum. If the amount of the fluxing agent is small, the minimum of glass is formed at the highest processing temperature, fluid glass attacking only a small portion of the refractory grains or crystals, which remain bonded and act as a rigid skeleton for the particle throughout the heating. There may be a low-temperature mineral acting as a flux in the original rock such as in natural cement rock; there may be an intimate surface contact bond between small crystals of refractory minerals which provide nuclei for a eutectic glass formation; or a low melting point flux may be added to the kiln charge from without, such as iron ores added to crushed magnesia particles. In any case, under conditions of limited glass formation with this type of ore, no deformation, pyro-plastic condition, or agglomeration and surface stickiness may be expected. In fact, the range of working temperature may be wide because an increase in time or temperature would not necessarily produce further glass. On the other hand, if available fluxing agents are present in large amounts, the physical conditions of the piece may change rapidly. A partial disappearance of the original crystal bond and aggregate structure may then result. Floating refractory grains may be noticed with increasing glass or fluid phase which finally may destroy the rigid skeleton of the ore particle and bring about deformation under bed load, impact on the lining, or rolling friction, with resulting agglomeration or adhesion to an overheated kiln lining.

Coarse-Crushed Pelletized Ore Under this group of kiln charge particles we have pieces in which original aggregation of well-bonded minerals exists in loose bonds with freed or crushed minerals and grains. Being pelletized with moisture and then dried or calcined before reaching incipient fusion, the porosity (or the number of void spaces) increases over that in the original ore. The action of small or large amounts of glass is somewhat similar, although deformation may set in sooner due to a weaker grain bond. The presence of finely-crushed minerals below the original crystal grain size may cause faster fluxing and earlier plastic stickiness if the first glass fluid is formed from a low-temperature mineral rather than a eutectic "contact" combination.

Finely-Ground Pelletized or Briquetted Ore and Dried Cake Kiln charge particles of this type are composed of finely-divided and blended minerals below their original size, and are rather loosely bonded. Permeability to fluid glass, as well as exposed fluxing surface, would be high, hence softening range in respect to time and temperature may be narrow if considerable glass is developed. On the other hand, if heating is uniform and controlled, *i.e.*, if the bed is not too deep, if heat is transferred at moderate rates for longer periods, rather than at a high rate for short periods, such artificially blended and formed particles may give relatively little trouble when crystallization out of a fluid glass solution increases refractoriness and prevents sudden deformation and agglomeration. In cement clinker burning all fluxing and melting does not appear at once, or necessarily at one temperature; nor does a glass solution, once formed, remain as such. In many instances of a more fully developed liquid phase, melting occurs, followed by recrystallization, with the final glass content reduced by crystal growth. In such cases, glass viscosity may increase to stiffen and harden the particle during crystallization. Of course, in the case of cement clinker formation the calcination of any remaining carbonate may act to absorb some of the exothermic heat released, thus preventing a sudden temperature rise and softening effect at that stage.

MECHANICS OF AGGLOMERATION

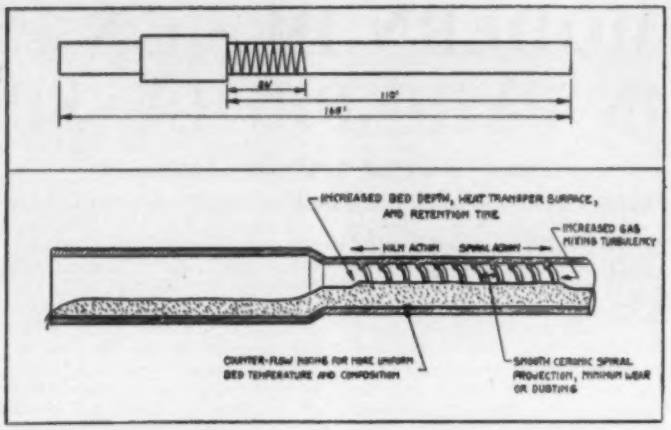
As the particles in a rolling bed of material approach the end of the flame, a distinct and abrupt rise appears in particle surface temperature due to radiant heat transfer. As the material begins to roll under the widening, hotter, and closer flame, the particle layer rolling and sliding on the bed surface is also continually deposited in a layer on the hot lining. Heat travels from the flame, from the lining reflection, and from the lining conduction to these particles in this outer bed-periphery layer. Heat to the central bed portion travels by radiation from the hotter outer particles, as well as by conduction from the hotter outer layer pieces. To some extent, a heat exchange undoubtedly is set up between the shielded central layers and the entrapped gases percolating and diffusing through the void

spaces. In fact, it is not at all improbable that a definite natural draft or slight stack-effect is set up in a loose bed of closely sized material. A part of this internal gas movement may be set in motion by escaping volatiles and the entrapping action of a rolling bed.

It is obvious that if we depend partly on radiation and conduction of hot top-layer particles to transfer heat to interior flame-shielded particles, these top-layer particles must be maintained at a higher-than-necessary process temperature. The deeper the bed, the greater this differential. It is also apparent that besides deep kiln beds, slow rotation and wide particle size range require higher flame temperature, as well as lining and outside particle temperature, for maintenance of kiln output with acceptable product grade uniformity. These conditions, however, are fraught with operating difficulties due to excessive balling and agglomeration tendencies.

As we are well aware, the cascading travel of a rolling bed of particles in the kiln produces particle-size segregation, non-uniform composition, and unequal travel speed and kiln residence time. Material entering the agglomerating zone under such bed condition will not be uniformly heat-softened. If calcination must be completed prior to glass formation, agglomeration will also be affected by the uniformity of calcination. It has been shown that despite all care in pre-mixing and blending of kiln feed material, a marked stratification of sizes and composition occurs in the bed after a short period of travel in the kiln. Cement kilns and refractory dolomite kilns, for example, may suffer from this section.

Numerous changes in lining shapes and projections have been tried, with but mediocre success, to offset this action, although we have recently received data from Europe on a new kiln lining design that has evidently had considerable success. In this European installation a smooth ceramic reverse-acting spiral projection was built into the calcining zone lining of a cement kiln. This spiral has not only lengthened the residence time in this zone (as a dam would do), but has also proved an efficient material mixer and heat exchanger for production of more uniform clinker. Wear is said to have been very nominal. In other words, without unduly restricting kiln cross section, this reverse-acting spiral has raised kiln efficiency (output and fuel economy), and brought about bed uniformity ahead of the critical


INCREASED BED DEPTH, HEAT TRANSFER SURFACE, AND RETENTION TIME
INCREASED GAS MIXING TURBULENCY
KILN ACTION
SPIRAL ACTION
COUNTER-FLOW MIXING FOR MORE UNIFORM BED TEMPERATURE AND COMPOSITION
SMOOTH CERAMIC SPIRAL PROJECTION, MINIMUM WEAR OR DUSTING

• Figure 1. Reverse-spiral mixer heat-exchange elements—operating cement kiln described in "Zement-Kalk-Gips".

incipient fusion zone. A wider application for this principle may be expected for certain processing. Figure 1 shows a generalized sketch of the system.

Agglomeration begins with surface stickiness of the larger particles in the bed layer exposed to flame and brick radiation. This hot layer is rather thin as the flame is approached, and can be distinguished easily in some kilns as it slides off the cooler and darker layers immediately beneath the surface of the bed. As the charge moves forward under the body of the flame, a slow mixing may be noticed between the brighter outer particles and the darker interior pieces, heat exchange taking place by conduction and radiation between these unevenly heated layers. Upon approaching the center of the fusion zone, the lining usually becomes rougher from scale deposits, and mixing is somewhat improved.

The form and degree which agglomeration of particles now takes on depends upon several factors, such as the following: size of granules or particles entering the hot zone; the dust load in the air and gases from cooler and kiln; the fines content within the bed; the bed depth; the temperature differential between flame and bed and between bed and the lining; the lining roughness; scale thickness and projection; the presence and location of rings or dams; kiln speed; the presence of occasional large balls; flame shape, direction, and temperature; and the relative distance of the flame from lining and bed surface.

As sufficient glass is being formed to cause surface wetting of the particles, these may now undergo some shrinkage due to the filling of pore spaces with glass, or they may expand due to gas escaping within the semi-liquid body. In the case of very small particles there may be a nodulizing effect upon reaching the initial softening stage, nodule size depending on the degree of glass wetting and rolling speed. These fines may also stick to the hotter and "wetter" surfaces of the more exposed larger ones, and thus be lifted out of the bed by the latter to be exposed to further melting and adhesion. Such building up of particles into clusters to form larger aggregates may cause these to float and become more and more exposed to the direct action of the flame. If they grow large enough, they cease to be completely covered by the bed at all, and often fuse into large logs and balls under flame impingement.

By this time the lining also has a coating or scale of similar composition and stickiness, and a periodic adhesion of agglomerated clusters and balls may develop, causing partial lifting of the rising wall into the flame until the viscosity of the bonding glass between the conglomerate and the lining coating drops sufficiently to cause parting. In the meantime, these clusters are being heated at a much greater rate than the smaller individual particles in the bed, setting up an increasing rate of build-up until a non-parting ring is formed on the lining. Under certain conditions with some materials it is possible, of course, to operate just below this ring-forming point, even to the stage of allowing the clustered pyro-plastic material to climb up the rising wall until they peel off under their own weight when suspended. This is a practice apparently tolerated in some plants

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2. The Caterpillar Scraper Line. Form No. 30375. This booklet contains specifications for the nine sizes of scrapers built by the company. Included are five sizes for use with crawler type tractors, three for use with wheel type and one tractor-scraper combination. Capacities range from 7 cu. yd. to 27. cu. yd. A hydraulically operated model is also shown. Attachments are presented by pictures and the various features are also illustrated. The Caterpillar Tractor Company.

3. Diamond Bits for Faster Drilling and Better Cores at Lower Cost Per Foot. Bulletin No. 520. The sixteen pages of this bulletin cover the subject of diamond drilling from the manufacturer to the user. The types of bits are illustrated and described, methods of manufacture are shown and explained, and various accessories are listed. Services of the company in recommending bits, reclaiming diamonds, and making test holes are explained. Sprague and Henwood Inc.

4. Now . . . A Superior Lightweight Concrete at a Lower Cost. A small-size 12-page bulletin that explains the use and advantages of Cemtein—a substance that causes a controlled air-entrainment in concrete. The properties of the concrete made with the material are pointed out and graphs show the important relationships. Technical data and instructions for use are included. Chemicals Division, VanHoven Company.

5. Save $ Out of Dust. Form 4556-5-52. This folder illustrates and presents information on a suction filter type dust collector. The construction, operation and installation of the collectors are given. Sample data are included and specifications are given. A cross-sectional drawing shows the interior details. Entoleter Division, The Safety Car Heating and Lighting Company.

6. Star-Kimble Direct-Current Motors and Generators. Bulletin B1001. The four pages of this folder show construction details and explain the major points of the d.c. motors made by the company. Various types of motors are shown including gearmotors and brakemotors. Star-Kimble Electric Company.

7. ReXon Coating No. 2. Bulletin R-2. The four pages of this folder type bulletin present facts about the material which is a chemically resistant concrete pipe coating. Directions for applying the material are included as well as other important items of information about the product. Hamilton Kent Manufacturing Company.

8. Dehydrators. This bulletin explains the operation of the sand drag type of dehydrator or classifier in washing plant operations. Complete specifications and capacities are listed and cutaway drawings are used to show construction features. Pioneer Engineering Works.

9. Nopco Ertrane C, the outstanding air-entraining agent for easier, more economical production of Air-Entraining Portland Cement. Ind. 35-52. The 12 pages of this bulletin serve to present the advantages of the material as an agent for producing air-entraining cement. Results of tests of clinker ground with the material, tests of concrete made with cement incorporating it, and cost per barrel of cement are included. The bulletin is designed to present the features to, and to answer the questions of, the cement plant executive and chemist. Nopco Chemical Company.

10. Ferrous Castings for Abrasion Resistance. This 24-page booklet suggests a system for analyzing service conditions, and selecting a ferrous alloy with suitable properties for the job. Tables are included which list the properties of various alloys, the properties of minerals commonly worked, and a great many tested applications in many industries specifying service, function, part, and recommendations. Illustrations and charts show metallic structure and wear test results. Types of abrasion testing are described and various alloys are ranked according to results. American Brake Shoe Company.

11. Binks Industrial Spray Nozzles. Bulletin No. 3200. This 40-page booklet covers a wide range of nozzles for all industrial applications. It describes various types of nozzles and uses cutaway drawings to show the construction and operation of them. Blue print drawings show proper installation details where this information is needed. Tables give capacities, dimensions, spray angles and other information. A handy index lists 29 different applications for spray nozzles with page references. Coal washing, gravel plants, asphalt nozzles, air washers, gas washers, oil sprays, and aerating are some of the fields covered. Binks Manufacturing Company.

12. Sensational 315 cfm Portable. Gyro-Flo. Form 2316. This four-page folder illustrates the new 315 c.f.m. size of rotary portable compressor. Drawings show the action of the rotary compressor and diagrams point out the method of cooling the air. The features of the compressor such as gasoline or diesel engine, weights, output, dimensions and appearance are brought out by the text and photos. A similar folder No. 2314 is available on the 105 c.f.m. model. A 210 c.f.m. is also included in the line. Ingersoll-Rand Company.

13. 105 c.f.m. Davey Compressors. Form E-257. The four pages of this bulletin

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describe the various types of 105 c.f.m. compressors. Gasoline, diesel, and electric trailer mounted units; "Auto-Air" truck mounted units; and stationary ones are listed and illustrated in detail. Complete specifications are included in a reference table. Davey Compressor Company.

14. **Link-Belt Bulk-Flo Feeder, Conveyor, Elevator in One Compact Fully Enclosed Assembly. Book No. 2475.** The 28 pages of this book contain photos of numerous applications of the Bulk-Flo, with typical layout diagrams, engineering data, tables, charts and formulas. One table shows the size, flowability, and abrasiveness of over 150 different materials and their adaptability to the elevator-conveyor. Link-Belt Company.

15. **A Condensed Catalog of Syntron Equipment. Catalog No. 525.** The 52 pages of this pocket size catalog summarize the entire line of the manufacturers' equipment. Included are such products as vibratory feeders, vibrating grizzlies and screens, jolters, feeders, vibrators, elevators, weighers, gasoline breakers and drills, bin level indicators, flow control valves, and heating elements. A pictorial index shows the typical product and refers to the pages where the line is shown. The catalog is illustrated profusely and the text is used only to point out the major features. Specifications which give sizes, capacities, power consumption, and other pertinent information are included. Syntron Company.

16. **How Effective Are Your Curing Room Closures?** This mailing folder points out the loss in heat and steam by poor curing room doors. It also shows typical installations and gives information about the Uni-Temp insulated doors and door carriers. The general features of both the door and the carrier are explained. Universal Door Carrier.

17. **Production Road; Mining Issue.** Although intended as a house magazine this publication goes into the use of the company's products in an interesting manner. Application of clutches and hydraulic drives to heavy-duty trucks, shovels, cranes, drills, mine cars, dozers, conveyors, asphalt plants, scrapers, hoists, and screens are illustrated and the uses of the machines explained in mining, quarrying, and digging operations. The major products of the company—hydraulic sheaves, couplings, take-offs, and concerters are shown as well as friciton clutches of all types. Twin-Disc Clutch Company.

18. **Tank Car Heater and Pumping Booster. Form AD-104.** The four pages of this bulletin present the features of the "Deuce" combination tank car heater and pumping booster. The bulletin explains the application of the machine to heating asphalt, tars, and other materials to the necessary process temperatures, and the delivery of them from tank car to distributor, storage tank, or transfer truck. Both the trailer mounted unit and skid mounted one are illustrated and the features and advantages are listed. Cutaway and sectional views show the construction of the unit. Complete specifications are given. Cleaver-Brooks Company, Road Machinery Division.

19. **Non-Fluid Oil for Lubrication of Pneumatic Tools and Equipment. Bulletin No. 580.** This four-page loose-leaf insert presents the facts and claims about the company's lubricating materials for air tools. A comparison of the company designation and the S.A.E. numbers are given for ease in selecting the right grade. The types of equipment that each grade is especially recommended for are listed. New York and New Jersey Lubricant Company.

20. **Cummins Diesels do so many jobs—so much better. Form BI-3500-152.** Half of this four-page folder is devoted to explaining the points of manufacture that produce the performance of the company's engines. The center pages illustrate typical applications in powering generators, locomotives, shovels and cranes. Case histories are cited. Cummins Engine Company.

21. **Towmotor Accessory Data—Scoop. Lit. No. AD-7.** This single sheet contains illustrations of the scoop which is designed for use on the Towmotor fork truck, and specifications of the device in both the slice bar and open models. Towmotor Corporation.

22. **GE Control. GEA-5781.** This is an eight-page guide for selecting electric and electronic controls, devices and accessories. It contains selection data in quick-reference form, photographs, and listings of specialized publications. Included are manual, magnetic, combination, and reversing motor starters; push-button stations; relays; limit switches; solenoids; photoelectric relays; electronic timer; electronic relay; pressure and vacuum switch; float switch; pressure governor; reduced voltage starter; and smoke density indicator and control. General Electric Company.

23. **Gar Wood Low-Mount Winches. Bulletin No. 149T.** This single-page bulletin covers two sizes of winches for mounting on trucks. These winches are designed for using minimum mounting space such as under a truck platform. In addition to suggesting mountings the bulletin contains dimension drawings and specifications. Gar Wood Industries, Wayne Division.

24. **Baughman's Endgate Spreader. Form A-353.** This single sheet presents the facts and data about a hydraulically operated endgate spreader for spreading sand, gravel, cinders, and similar materials. The spreader is cab-controlled and hydraulically regulated for width of spread. Baughman Manufacturing Company.

25. **Williams Fine Grinding and Air Separating Equipment. Bulletin No. 600.** Illustrations, flow sheets, and cutaway views make up a large part of the 12 pages of this bulletin. Included in the bulletin are roller mills, spinner separators, vane separators, mechanical air separators, and the helix-seal mill. Applications are suggested and performance data and sizes are listed. Williams Patent Crusher and Pulverizer Company.

26. **Minneapolis-Moline high-turbulence Engines and Power Units. Bulletin 1026.** The 24-pages of this illustrated bulletin show the various models of engines, the different accessories, construction details, and complete assemblies that are available. Models for four types of fuels are shown, and a graph illustrates the interchangeability of parts between the various models. Typical applications are shown and some of the steps in the manufacture. Minneapolis-Moline Company.

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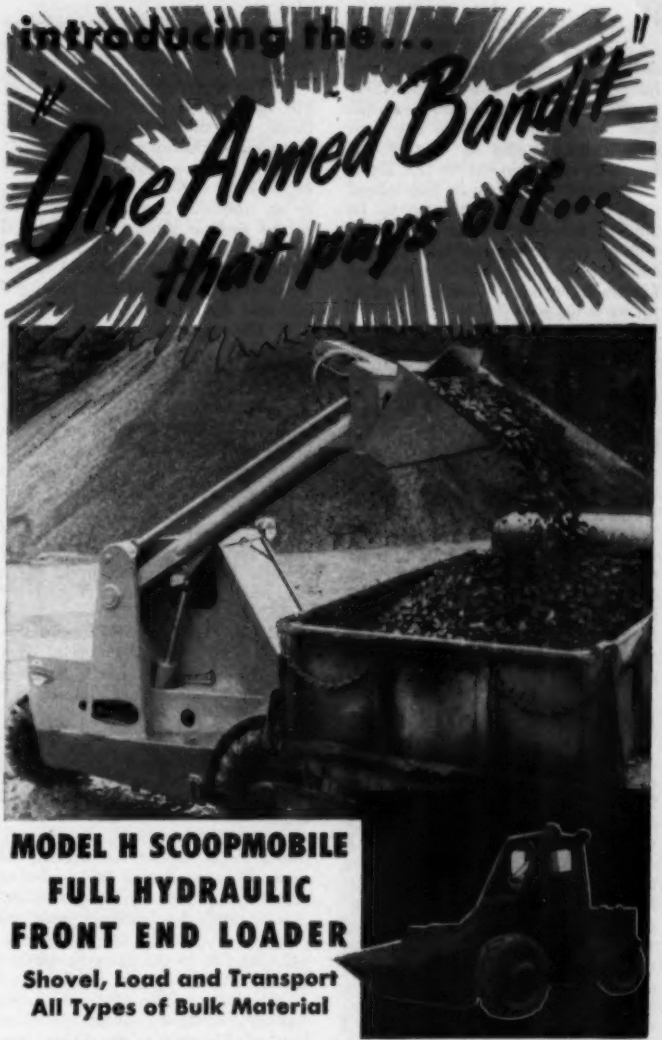
and considered a necessary evil. Some operators even go so far as to say that the only control is excess cold hood-leakage air. This is an expedient that is costly, inefficient, and unnecessary. Sometimes, of course, moderate agglomeration into clusters can be tolerated in a short kiln zone when these aggregations can be broken up through secondary combustion air chilling prior to leaving the kiln, and without resorting to excess air for the purpose.

Clustering and balling of any kind is, however, an improper processing condition, as it sets up a series of process disturbances and difficulties. At best, the action is haphazard and fluctuating, and affects material higher up in the kiln due to partial damming action. Particle grade becomes non-uniform; the glass phase in the outer portions of these balls is generally too far advanced; combustion and flame action for the remaining bed particles is disturbed; and vibration and unequal kiln loading may result. The larger balls have a tendency to smash and grind particles in the bed, especially if they become cone-shaped and roll partly up the kiln before breaking up. Such balls may require labor in handling at the firing hood and discharge; their size and heat content make it practically impossible to cool and handle them in efficient coolers and recuperators; they cause excessive dusting; and they cannot be easily handled or conveyed by ordinary crushers or conveyors or labor-saving devices on a continuous basis.

Coating and Ring Formation Serious as may be the action and consequences of excessive agglomeration and ball formation on product grade and process efficiency, the build-up of scale coating and rings may sometimes cause even greater operating concern, and represent a large cost item in the form of removal costs and loss in production.

Many articles have appeared in the literature of theoretical and practical aspects of lining fusion phenomena, their causes, control, and removal. Investigators have established certain relationships between fluxing ingredients in fuel and ore, in the ratios of certain minerals in the feed mix, in the firing technique, in the temperature control of the hot zone, and in the time-temperature variations of the charge ahead of the fluxing zone. In the writer's opinion and experience these are undoubtedly influencing factors, any one of which may become a major critical condition. However,



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improvements in raw material sizing or composition control, fuel supply, close temperature regulation, and intelligent operation by trained firemen supplied with accurate continuous data on all feed and kiln condition changes can be worked out by plant management to the limits of economic justification. Specialized process engineering remains to be applied, however, to the direct control of ring formation and coating fusion after these above-mentioned factors have been taken care of as far as is warranted.

Since the phenomena are those of glass formation—physical, chemical, or both—and within a definite temperature range peculiar to each process and material composition, the problem should be directed toward lining temperature control. Lining temperature control in the critical zone is possible by two methods: flame heat transfer to the lining, and heat transfer from the lining. Heat *received from* the flame is a function of flame temperature, lining reflectivity, and flame distance, while heat *conducted* from the lining surface is a function of bed cooling effect, conductivity of lining plus coating, and shell temperature.

Ring Growth The growth and deposit of fusible materials on the refractory lining takes the form either of a more or less uniform scale or coating, or one or more localized rings of various widths. The causes of ring growth are due to many factors. Whether ring formation is brought about by high alkali and low fusing ash impingement on the lining caused by ash from fuel; whether it is due to exothermic melt reactions pyramided onto maximum flame effect; whether it is due to overheated linings receiving excess dust and entrained particles from the bed or from secondary air from the cooler; whether it is due to fusing material adhering in agglomerated masses; or whether it is due to a relatively cool material baking to the lining—in the final analysis, it is a localized temperature condition, and once started, will cause growth at an increasing rate. Since a ring invariably will form in the area near the end of the flame, it is here that the probable combination of coarser ash particle impact, of maximum reducing condition under near maximum temperature, and usually widest flame diameter and flame scrubbing on the lining exert their contributing effects. It is also in this ring zone that the temperature differential between lining and bed is usually the greatest.

Once a ring has started, conditions begin to deteriorate rapidly as follows:

1. The surface or inner section of the ring grows ever closer to the flame, and thus is under increasing reducing conditions and temperature.

2. As the ring builds up, and fuel input is not reduced, the deposit acts as an insulator, and less heat flows to the shell as more is being stored in its growing mass. This increase in ring temperature, of course, causes more glass formation and increased ore and dust pick-up tendency.

3. The gas-flow pattern becomes changed. In an abrupt and short ring the gases along the lining are made to flow and bend from their path toward the kiln center at the ring opening as through an orifice, while any entrained dust and sand-size particles are thrown out against the ring by centrifugal force, thus aiding the build-up and thickening process. Behind the ring, on the other hand, strong back eddies are formed which tend to build up a dust load at this point. That these eddies are strong and active is borne out by the appearance of secondary or reaction rings made up of finer particles of dust behind the hot zone ring. These secondary deposits owe their origin, no doubt, to the eddy effects behind the first ring, much as sand ripples, dunes, and wind cornices are formed under high wind action similar to that existing in a kiln.

4. As the ring grows and the orifice becomes further constricted, the normally cone-shaped and widening flame tip begins to be pulled together, and the burning gases are drawn out farther and at greater velocity due to the gas flow pattern brought about by the orifice ahead of the flame. This action probably has some tendency to cool the outer base of the ring at the lining contact, and may cause it eventually to crack loose. No doubt, many operators have witnessed a ring disengaging itself and traveling up or down the kiln for a short distance before cracking apart.

5. The projecting rim and side of the ring facing the hot zone will act as a heat reflector, tending to concentrate more heat below the ring, while at the same time acting as a shield for the material above, thus tending to cool the area behind it to some extent.

In the meantime, other changes take place to the detriment of smooth operation. The material bed depth and particle residence time increases, while attrition and eddy effect cause the proportion of fines to build up behind the ring. Unless feed is proportionally reduced to hold bed load near constant in the upper kiln sections, and unless secondary air flow is measured and adjusted as it should be to the dampening effect of a growing ring, the combustion process, heat release, and time-temperature profile of the material is greatly disturbed. Off-grade product and loss in production are direct results of these conditions for some time, even after the ring has been removed and a balance has been re-established.

Since rings vary widely in physical character, depending on whether they are narrow or wide, whether they are built up rapidly in a few hours or slowly over many days, whether they are fused and melted together as a single mass, whether made up of an aggregate and agglomeration of ore particles or built up in thin layers by wind plating effect, the removal of such rings suggests various techniques, and promises varying efficiency. The techniques commonly employed include shooting with slugs by powder or compressed air; use of Cardox bombs through the shell; scraping or boring with long and heavy water-cooled boring bars; use of steam or water lances and jets; melting down with increased fuel and temperature, or shifting the burner closer to the ring; re-aiming the flame; employing strong reducing or oxidizing conditions for short alternate periods; changing the kiln draft drastically for short periods; stopping the kiln at intervals, cooling and shrinking the ring until it breaks, or until particles of ore will wedge between the lining and ring to pry it off; manually punching the ring out with bars when its position is close enough; or under extreme cases, cooling the kiln off altogether and removing the ring with air drills. However, preventive methods are much to be preferred, and engineering know-how is available to help the operators in re-designing kiln and burning systems and operating techniques for smoother operation under fusing conditions.

Lining Coating The functions and effects of an ore-fluxed coating surface on the refractory lining in the hot zone of rotary kilns are manifold. Today we often think more in terms of this more or less permanent coating surface, than we do of the refractory liner itself. In other words, we are increasingly interested in the physical ability of the brick lining to absorb a fluid glass into its pores to form

an armor coat for protecting the lining from heat and abrasion, or in the chemical reaction of the brick to form a coating glass of certain composition. Thus it is necessary to consider spalling resistance of a kiln liner refractory less in terms of heat shock of the brick itself, and more in terms of changes in spalling resistance caused by infiltration and absorption of glasses into the brick pores or by chemical reaction and recrystallization leading to a composite liner in which the heat-exposed layer is of an altered composition with new properties. When the ceramist compounds a glaze for application to a fired clay unit such as a pottery piece or a masonry unit such as terra cotta or face tiles, the acid and alkali constituents are balanced to produce a glaze or glass coating that forms a strong bond with the ceramic body underneath, and one which has similar expanding and contracting coefficients, in order not to spall off. A glass-impregnated refractory lining is very similar to a pottery glaze in this respect, where heating or cooling will cause differential expansion or contraction between the coating and the liner, causing tension or compression forces to spall the liner off at the glass boundary within the brick.

In the case of one kiln, fluxing may take place between a refractory ore and a refractory liner, such as lime and clay brick at 2,700 deg. F. and a 50-50 composition. As more lime is dissolved, the melting point rises again, and the glass, which has penetrated a short distance into the lining, now forms a high-line glaze which becomes an abrasion- and fluxing-resistant coating if held below the softening temperature. In the case of another kiln, the ore or coal ash may melt in spots and be absorbed into the brick pores without much brick fluxing, the fluid glass penetrating until it freezes at a certain temperature boundary within the brick. Here the surface of the lining may not only be glazed, but may be slowly covered with successive layers of scale and fluid glass freezing to a solid, as further heat-protecting layers are added and the coating thickens.

In the first case, the impregnated and coated lining is desirable and protective, operating temperatures within the kiln remaining below the level of further fluxing. In the second case, small changes in operating conditions may tend toward adding further fluxed ore material to the lining until kiln diameter becomes seriously restricted. When the density and the chemical composition of a liner brick has been altered for a certain depth, heat conductivity and thermal expansion is also changed. This creates a strain line causing a "plucking" type of spalling, as can be observed in kilns whose linings may take on the appearance of worn cobblestones.

Actually, the whole problem of kiln linings may eventually resolve itself into one of creating a refractory liner intended to function primarily as an intermediary base between a refractory glaze or coating of a certain thickness and penetration and the kiln shell, the liner possibly being furnished with a compounded glaze that can be washed and then fired into the installed bricks. Such a glaze may or may not contain some of the finely ground ore to be processed. Much pure research and co-operative investigation is still needed; and there must be team work between brick manufacturers and kiln operators before the protective kiln lining with coating is applicable to all pyroprocesses and materials. It is the purpose of this discussion to stimulate and point out the possibilities and trends indicative of modern thought on the subject. For the brick man this implies thinking in terms of refractory glass coatings and their bonds and thermal expansion properties in relation to the brick properties, while for the kiln operator progressive thought must be directed at control of lining temperature from within and without to maintain such stable coatings at the optimum thickness.

Positive Scaling Control Needed

Fluctuations in temperature above or below the softening or melting point of the scale or coating on the lining will bring on a loss or a build-up of this coating, both of which are to be avoided. Our efforts are directed at forming the protective coating with a uniform non-varying thickness. As pointed out earlier, this requires control from within and without. A previous discussion described the compound flame and dual zone control as a means of lowering flame temperature, increasing heat transfer, inhibiting heat and temperature localizing on the lining and material, and varying and adjusting heat release location quickly and easily without upsetting B.t.u. input and temperature profile above the hot zone. Here we want to point to another supplementing control feature which, if applied with the compound flame, can only improve scaling control.

There have been isolated instances in which kiln operators have attempted to cool kiln shells at the hot zone by various methods. Certainly, the idea and practice of furnace wall cooling is not new; it is employed extensively in metallurgical and other industries. A foreign cement plant has used shell water cooling around the hot zone for many years, and there are also instances of moderate and half-hearted attempts at shell air cooling.

At first glance, it would appear that shell cooling is an inefficient and wasteful practice, diametrical in concept and practice to insulation for heat conservation. However, a second look may cause us to sharpen our pencil and balance overall costs of lining wear and scale removing operations, production losses due to scale and ring build-up, and loss in fuel due to use of excess air for cooling at the hot zone, as well as the indirect costs from fluctuating product grade against a slightly increased heat flow through the lining in the critical zone. Possibly we can afford the escape of a few B.t.u.'s under controlled conditions if thereby a difficult operation can be smoothed out for increased production.

Shell radiation losses from the hot zone only may vary from 2 percent to 6 percent of the total heat input, depending on the kiln length to diameter ratio and operating temperature level. However, a 30 percent or 50 percent increase in hot zone radiation is only a 1 percent or 2 percent increase on the whole, and can be more than offset by the benefits that may be achieved through more positive lining and coating temperature control, keeping in mind that we are here concerned only with pyro-processing operations in which balling, scaling, and ring formation are critical byproducts of "normal" operation.

Kiln shell cooling in the hot zone area by natural radiation and convection is haphazard and variable to some extent. It is influenced by kiln placement or position in respect to an outdoor or indoor location, variable heating or re-radiation from other kilns standing or operating in the vicinity, and daily and seasonal changes in wind, rain, sun, drafts, and air temperatures. From changes within the kiln, heat flow through the lining varies with lining surface temperature about every minute when the bed covers a portion, thus causing temperature drops as much as 250 deg. F. between the bottom and top edges of the bed before and after coverage. Fluctuations in flame heat generation, distance from

lining, ring growth, and build-up or loss of scale coating or removal all cause heat flow changes through the lining and shell to the outside.

If a coating of fluxed ore is allowed to bond and build up on the refractory lining to a certain thickness, this coating also acts as an insulator, and will cause the temperature at the brick surface and within the lining to drop. This in turn lowers the rate of heat flow through the lining. By exercising some control over shell heat loss with convection air cooling from the outside, the heat flow through the lining plus coating can be brought back to its original rate of outflow. The net effect of this would be that the refractory lining, *per se*, now operates at a lower surface temperature below the fluxing point at the surface (being insulated by the coating), yet conducting no more heat to the shell than formerly. Generally, however, we want to go beyond this point of original heat flow out and at the expense of a small increase in heat flow through the lining and shell, drop the coating surface temperature below the original brick face or lining face temperature in order to check further coating growth over the lining.

In some kilns and processes, this temperature and heat flow balance establishes itself automatically after a fashion, the coating and lining melting back as the thickness increases to raise the surface temperature through increased insulation from the coating, until the thinned lining plus coating finally carries sufficient heat away to freeze the glass in the lining brick. Then scale grows again for the next cycle. Under some process conditions, periodic build-up and detachment is an accepted cycle, but it should be prevented, if possible, through the operational and design factors discussed in this series.

Many operations are extremely sensitive to small changes in temperature. However, this apparent narrow operating range may be entirely due to establishing the wrong temperature profile for the particular material by burner and kiln design limitations, or by bed depth and material sizing, factors which contribute to the necessity of having to operate at the upper critical temperature limit, rather than at a safer and lower level without loss in production. Thus, if the lining temperature can be dropped 50 to 200 deg. F. and held there, the coating thickness may be maintained constant or controlled. Positive regulation over heat flow through lining and shell may be exercised by providing the hot zone kiln shell with efficient cooling fins surrounded by a close-fitting stationary jacket through which cool air is pulled by damper-controlled stack draft or by fan. If even greater cooling is indicated and economically and operationally justified, the evaporative type of cooling may be added to air cooling for heat flow control through the lining. Figure 2 shows an arrangement proposed by the writer, the light-gage jacket having rubbing seals and positive provisions for air flow guidance and regulation for maximum uniform heat abstraction or retention. Kilns operating within buildings would obtain cooling air through ducts from the outside to the jacket inlets. When clean hot or warm air can be used for material or fuel drying, combustion air heating, etc., the use of a fan rather than jacket stacks is indicated.

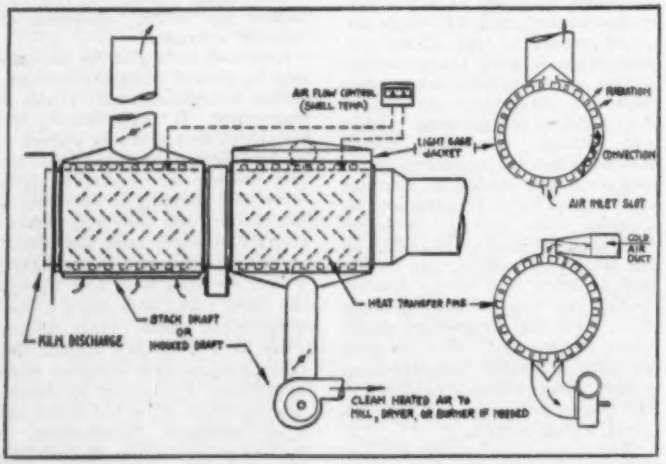
Naturally, this controlled shell cooling is also a distinct advantage in maintaining the kiln tire, trunnions, running elements, and kiln end steel at cooler and safer heat levels near the hot zone. Automatic thermostat control maintains the kiln shell temperature at a desirable level by continuous measurement of shell temperature acting to regulate air or water flow over the finned shell section around the critical hot zone area to be controlled. Since the shell also can be heated above normal as well as cooled below normal temperatures, certain obvious advantages during starting up or stoppages of kiln rotation can be realized with such temperature regulation.

Hot Zone Design In conjunction with the controlled shell air-cooling system and the special compound flame generation and dual hot zone control system, a third design provision should be considered for this class of rotary kiln operation, namely the enlarged flame generation zone. This is not to be confused with an enlarged calcining zone, but is rather to be considered as an expedient to lower the lining or coating temperature, and increase the relative heating or heat transfer of flame to kiln charge over that of flame to lining through more favorable flame spacing and positioning in respect to bed and lining. This is not all. It was indicated earlier that shallow beds and high kiln peripheral speeds are instrumental in allowing operation at lower temperatures. The enlarged diameter of the heat generating zone aids considerably in this respect, as it spreads the material surface and provides higher lining speed.

Aside from these very obvious advantages, the enlarged kiln section will allow considerable scale build-up, if no other control is exercised over it, without affecting combustion and gas flow, or without tending to constrict and dam up the material above the center zone level. If boring bars are to be used, the scale build-up need not go beyond the normal lining diameter of the remaining kiln, and the effect of scale removal or build-up in an enlarged hot zone is much less on the material behind or above such an area than it would be if the scale growth or removal restricted and then enlarged the flow path, as is the case with a hot zone diameter equal to the upper kiln zones. In other words, diameter changes in

(*Continued on page* 112)

• Figure 2. Kiln lining heat flow control.



Screenings

by William M. Avery

WRITING in the current issue of your favorite journal, Tax Counselor Harold J. Ashe opines that a good many businessmen fail to take tax deductions on expenses incurred in attending their trade association conventions. Well, Mr. Ashe is an expert and should know, but just off-hand we'd say this oversight isn't exactly rampant among convention attenders of our acquaintance. In fact, some of them are thoroughly capable of teaching Mr. Ashe a thing or two on the subject, particularly with respect to the line of demarcation between legitimate and illegitimate expenses.

For example, Mr. Ashe believes and specifically states that such items as theatre tickets, night club expenses, liquor bills and support for the little woman are purely personal outlays, and therefore have no place in a record of legitimate convention expenses. If Mr. Ashe thinks that these are illegitimate expenses, he'd really blow a gasket over some of the items that appear to go into the record unchallenged. In our circle of acquaintances it's a mighty dull convention that doesn't necessitate the purchase for strictly business purposes of such varied paraphernalia as iron lungs, totem poles, traction splints, seeing-eye dogs, upper and lower dentures, toupees, high-speed calculating machines, strait-jackets Thompson sub-machine guns, and stomach pumps.

At a really slam-bang affair in Chicago, where exuberance may well run several miles higher than the stratosphere, some of the boys can be counted on to purchase outright or make sizable down payments on such landmarks as the Michigan Avenue Bridge, the Shedd Aquarium, the Board of Trade Building, the 606 Club, the Chicago Avenue Water Tower, and the Carter Harrison Crib. Since nobody in his right mind could possibly assign any personal motivation for such cosmic transactions, we leave it to Mr. Ashe and the Bureau of Internal Revenue to refute the logic of crediting them to legitimate expense incurred in the line of duty.

Silly Boy!

OUR candidate for the most fascinating news story of the month is an item from the San Francisco *Call Bulletin* which reveals that the Central Eureka Mining Company of that city has purchased the Kaufman Meat Company of San Jose. According to Central Eureka's president, the merger will enable the parent organization to continue its gold mining development. Only thing we can't figure out is why the heck he wants to waste any more time on a cheap material like gold.

History Lesson

SINCE nobody has evinced the slightest interest in the subject, we have gone to a great deal of trouble to trace the origin of the phrase "leave no stone unturned". We might almost say that we left no stone unturned in our zeal to get at the facts, but the truth of the matter is that we didn't so much as nudge a grain of sand.

Well, kiddies, it all dates back to 477 B.C., to a period so remote that

it even antedates the Democrats' lease on Washington. It seems that a Persian general named Mardonius was on the receiving end of a shellacking at the hands of an army commanded by Polycrates. Just before he yelled "Uncle", Mardonius buried his liquid assets, including six shares of General Motors preferred, under a handy stone, forgetting in his haste to establish any means of relocating the hiding place. When things had calmed down a bit, he issued an order to his men "to leave no stone unturned" in their search for the treasure.

Unluckily for posterity, the blokes succeeded, and suspicious, absent-minded people have ever since been prone to bury things in out-of-the-way places rather than pay a nominal rental fee for a deposit box. Any questions?

Ancient History

HERE'S a bit of human interest stuff that got screened out of our story on the Dewey Portland Cement Co. (see page 114). Seems a fellow named Tom Mix was night marshall of the town of Dewey, Okla., back in 1907, when the Tyler family started the cement plant there. In those days there weren't so many opportunities for a law enforcement officer to turn a fast buck, so Mix also held down a job in the quarry.

One day a movie company pulled into town and started filming a horse opera right next to the quarry. They needed someone who could bulldog. Mix offered his services and went on to become a movie idol.

Our arteries tightened up a notch when we related this story to our small son, whose only response was, "Never heard of the guy, Pop."

Macht Nichts Aus

ACCORDING to calculations recently reported to the American Geophysical Union, the age of the oldest rocks on earth is around 2,200,000,000 years. The Union's spokesman admits that this figure may be in error by several million years, but he points out that this makes little difference in the vast sweep of world time. We note that the disclosure was made in Washington, D. C., where the same nonchalant attitude prevails toward all digits within umpteen places of the decimal point.

AGGREGATE IS WHERE YOU FIND IT!

TODAY a cotton or cornfield, or pasture—tomorrow a thriving sand and gravel business. That's the history of many producers — the ones that produce material to meet exacting specifications.

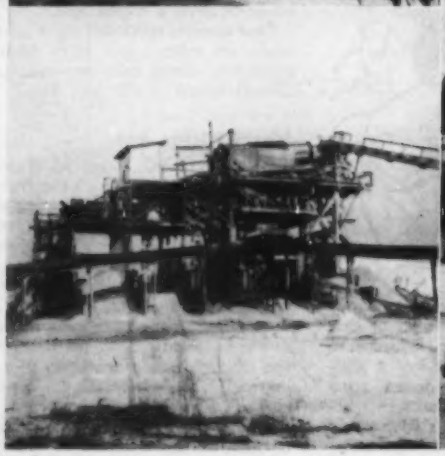
Such a producer is Becker County Sand & Gravel Co. — one of America's largest. With its headquarters in Minnesota and various plants in Minnesota and Iowa, Becker County is operating a number of highly successful plants in the South.

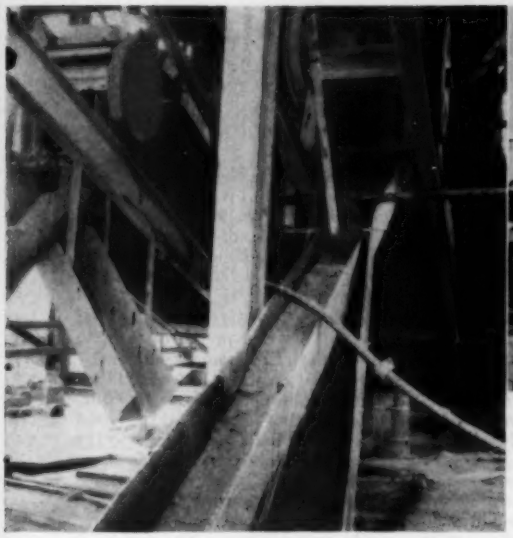
The aggregate was there—they found it—they process it to meet exacting specifications. Deposits are very difficult in some cases. Typical "Dixie" plants of Becker County Sand & Gravel are shown.

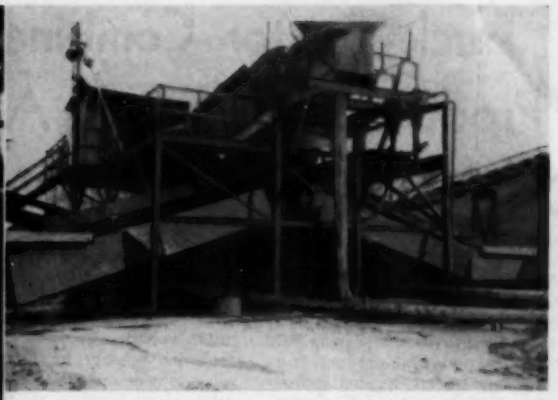
Below: Material is conveyed from pit across Cape Fear River to plant on opposite shore, at Becker County's Fayetteville, North Carolina plant—shown at bottom.

Bottom left. Two Eagle Fine Material Washer-Classifier-Dehydraters provide two gradations of sand at this plant.

Bottom right: Camden, South Carolina plant of Becker County Sand & Gravel Co. — three Eagle Screw units assure premium materials.







Above: Kathwood, South Carolina plant — four Eagle Double Screw units provide an abundance of clean, classified material.

At left: Chesaw, South Carolina, plant uses two Eagle Screw units to assure specification materials.

Eagle WASHING AND CLASSIFYING EQUIPMENT MAKES IT USABLE

Successful producers everywhere turn to Eagle for dependable recommendations based upon over 35 years of experience. The design and construction of Eagle Washing & Classifying Equipment is the result of literally thousands of installations. We learned "the hard way" and today users of Eagle equipment reap the benefit.

Correct tub design, proper screw pitch and r.p.m., proved positioning of wash water inlets and volume of water to the rising column of wash water, tested weir design —all are important factors. They are combined in Eagle Screw units to assure maximum performance and long service life for any aggregate producer. Today's rigid specifications **plus** competition dictate your consideration of Eagle equipment. Send for the facts!

EAGLE IRON WORKS 153 Holcomb Ave. Des Moines, Iowa

Truck-Tractor Combinations Accelerate Production at South African Lime Plant

DELIVERY of essential shipments of lime to gold mines in the area of Johannesburg, South Africa, has been substantially accelerated by the acquisition of additional quarry equipment by the Union Lime Company, Ltd. The firm is one of the major producers in the Cape Province, supplying pure lime and various lime products from its limestone quarry, located approximately 40 miles west of Kimberley, the internationally famous diamond city.

Consisting of five combinations of International tractor trucks and Easton 20-ton capacity side-tipping semi-trailers, the new equipment is being used to transport limestone from the quarry face to the primary crusher. The tractors are equipped with double reduction rear axles, an arrangement well suited to the steady grind, considering that in their first 16 months of operation, a total of 1,000,000 tons of stone, or a daily average of 3,700 tons, was hauled by the four combinations that work each day. One combination is held in emergency standby.

On an hourly basis, the working combinations carry twenty 16-ton loads a distance of 600 to 1,000 yards to the primary hopper. Including the return trip, the circuit is covered in from 8 to 10 minutes, with 4 minutes and 30 seconds for loading at the 2½-cu. yd. shovel. In the course of a month 5,040 such circuits are made. A record monthly haul of approximately 76,420 tons was established recently, according to Denis Schierhout, quarry manager. Mr. Schierhout believes this figure could be increased if the crushing plant were able to handle more volume.

Truck haulage has made it possible to resume loading only 30 minutes after blasting at the quarry face. This is an inestimable improvement over the old system, which required the movement of track. Under that arrangement stone was hauled to the crushers in 16-ton trolley cars drawn by mules or attached to an endless rope driven by a steam capstan. Only 1,000 tons of raw material could be hauled each eight-hour shift, while 5,000 tons were required to maintain steady production.

Of the approximately 70,000 tons of stone hauled to the crushing site, 30,000 tons of high-quality product is eventually routed to the lime works, while the remaining 40,000 tons, comprising limestone and shale, is used in cement manufacture, most of it by the Anglo-Alpha Cement Company, Ltd., of Kimberley. Actually, it was Union Lime Company's decision to supply raw product for cement from material remaining after the lime rock was selected that led to the decision to adopt the truck-trailer operation.

Primary crushing is accomplished with an Allis-Chalmers 60- by 48-in. jaw crusher. A single fixed hoist tips the load of each trailer into the hopper of the crusher, which operates with an 8-in. open side setting. The unit was chosen for its large rated capacity to serve both the lime and cement plants.

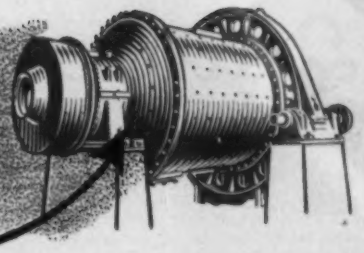
Discharge is belted to a grizzly with 6-in. openings, from which the plus material is sent to a series of picking belts for separating the lime and cement rock. The plus 6-in. material contains a small portion of comparatively high silica rock, undesirable in lime production, which is hand picked and passed on to the belt conveyor handling the minus 6-in. material. Plus 6-in. material suited for lime production is carried on a conveyor to the lime plant to be processed through the vertical kilns or stored.

Material passing through the grizzly, together with rejects from the picking belts, goes on a con-

(*Continued on page* 120)

• **Overall operations view: Union Lime Company's quarry and primary crushing plant in the foreground. After initial crushing, the material is conveyed to the open-sided building to the left, where lime rock is selected and routed to the company's lime works (upper left). Cement rock undergoes further reduction and is then routed to the Anglo-Alpha Cement plant, shown at the upper right.**

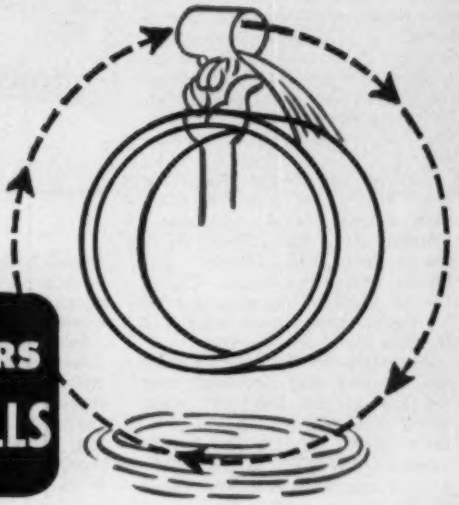
"Inside Story"



of Allis-Chalmers Oil Lubricated Trunnion Bearing...

AN OILING BUCKET inside this Allis-Chalmers trunnion bearing revolves with the trunnion . . . lifts oil from the reservoir in the bottom of the bearing housing to an oil distributing pan above the bearing. From here it floods down onto the bearing, lubricating the full face of the bearing uniformly and continuously.

You'll always have the comforting assurance that the all-important trunnion bearing on your mill is being dependably lubricated. This assured protection of internal lubrication is standard on all Allis-Chalmers oil lubricated bearings — even on installations where a separate external oiling system is used. A-3722



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These protective features of A-C trunnion bearings also give you savings in power and maintenance —

★ An improved seal keeps dirt out of oil and has been designed to provide for mill expansion.

★ A hand operated, high pressure lubricant pump "floats" the mill after shut-down . . . eliminates dry starting.

★ If desired, an external system for filtering and cooling can be added to the internal oiling system.

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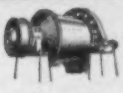

Grinding Mills

Kilns, Coolers, Dryers

Quarry in the Sky . . . .

another ON THE SPOT report

SCHEDULED for completion some time in 1954, Lookout Point Dam in Oregon is another of the huge Corps of Engineers projects now in the process of construction in the far West.

Located on the Middle Fork of the Willamette River near the town of Lowell, 145 miles southeast of Portland, the earthen dam and gravity-type concrete spillway will drain an estimated 991 square miles of the Willamette River Basin. Besides flood control, the ultimate plan includes a 115,000-kw. powerhouse. Placing of about 850,000 cu. yd. of mass and structural concrete in the spillway and appurtenant structures is about one-half finished as the 1952 spring season gets underway.

The general contract, involving about $18,700,000, is held by Morrison - Kiewit - Macco (Morrison - Knudson Co., Inc., Boise; Peter Kiewit Sons Co., Omaha; and Macco Corp., Paramount, Calif.). Overall length of the dam is 3,370 ft., the concrete section rising 278 ft. from foundation to crest.

Aggregates for the concrete plant are quarried and processed near the site in the 350-t.p.h. plant, which was designed and built by the Conveyor Co., Los Angeles. An estimated 1,600,000 tons of specification aggregates will be required for the concrete used in the job.

The location of the deposit is perhaps the most interesting aspect of the project. Preliminary prospecting revealed that river gravel and sand in the vicinity was too reactive and otherwise undesirable for use as aggregate; and the nearest source of acceptable material proved to be high up on Eagle Rock Mountain, which overlooks the site of the dam. The quarry, as established, is 1,280 ft. higher in elevation than the tracks at the concrete plant. The material is required to travel about 1,200 ft. by truck and nearly 3,500 ft. by belt conveyors before it reaches the processing plant far below. Three raw surge piles are employed at three separate levels between the primary crusher and the finishing plant. This division of surge storage was deemed advisable because of unstable soil conditions on the mountainside.

The quarry site was nearly inaccessible at the beginning, and many weeks of arduous work were required, after the contract was awarded in May, 1950, for building access roads and establishing the quarry-to-crusher right-of-way. The primary crusher was set part way down the slope, and one of the perilous tasks in its installation was the moving of the 30-ton frame up the mountain. The steep access road has many sharp switchbacks. A truck and low-bed trailer were aided by two tractors, one ahead and one behind, to inch the heavy load up the grade and around the hairpin turns.

From high up on Eagle Rock Mountain a 350 t.p.h. plant is supplying aggregate for the Lookout Point Dam project in Orgeon

By HARRY F. UTLEY

The rock being quarried is principally a diabase, with intrusions of basalt and porphyritic diabase. It is drilled with Gardner-Denver wagon drills and shot and worked in benches. The fragments are loaded by a Northwest 80D 2½-cu. yd. diesel shovel into 15-cu. yd. Euclid end-dump trucks which deliver to the primary crusher. The road to the crusher was laid out without switchbacks and handles two-way traffic.

Quarried material is fed to the 42-in Allis-Chalmers Superior McCully primary crusher by an S-A 6- by 15-ft. manganese-steel apron feeder, the minus 7-in. product being carried horizontally by a 48-in. by 132-ft. belt conveyor to the first surge pile (300 tons' live storage). Recovery in the tunnel is by a Jeffrey 48-in by 8½-ft. pan feeder, the second conveyor (36 in. by 1570 ft.) running down grade and achieving a 336-ft. drop in elevation before building the second surge pile of 40,000 tons' live storage. The 36-in. by 1416-ft. conveyor from surge pile No. 2 crosses an existing highway and road and rail relocations while lowering the material still another 262 ft. Another Jeffrey pan feeder serves the belt, both feeders having automatic cut-offs to prevent belt overloads. From the third and final 40,000-ton live storage surge pile the material is carried up to the crushing and screening plant by a 36-in. by 261-ft. conveyor, feed to the plant being regulated by still another Jeffrey feeder, remote-controlled from the plant.

Coarse aggregates are classified by Allis-Chalmers 5- by 12-ft. and 6- by 12-ft. double-deck Ripl-Flo screens, each of three sets of screens being followed by a reduction crusher in open circuit to produce the three required sizes of finished coarse material (minus 6-in. plus 3-in., minus 3-in. plus 1½-in.; minus 1½-in. plus ¾-in.). Plus 6-in. is scalped and broken by a Traylor 4-ft. finishing crusher, plus 3-in. by an Allis-Chalmers No. 848 Hydrocone crusher, and plus 1½-in. by an Allis-Chalmers No. 530 Hydrocone. Intermediate sizes rejected by the bottom decks may also be recrushed to balance output as desired. The two largest sizes of finished coarse rock are washed over Cedarapids 42-in. by 10-ft. screens before going to stockpile, while the 1½- to ¾-in. is similarly

View of the Lookout Point Dam aggregate plant and construction site on the Middle Fork of the Willamette River, east of Eugene, Ore. Raw material is supplied by conveyors from a quarry located on a mountain top at an elevation of about 1,200 ft. above the plant. The first bucket of concrete was placed by high-line cableway a year ago.

Concrete batching and mixing plant, with refrigerating equipment housed in building at left. South cableway tower may be seen at right.

Stock-piling conveyors will stock an estimated 1,800,000 tons of washed and sized material before the structure is finished. Portion of the processing plant is seen in the right center background.

Looking down on one of the finishing crushers which balance the coarse rock, as well as produce fines.

washed and dewatered by a Cedarapids 36-in. by 8-ft. screen. Finished-material piles are arranged in line over a recovery tunnel.

Minus ¾-in. throughs from the last screen, plus the product of the No. 530 crusher, are carried up to a pair of Allis-Chalmers 5- by 12-ft. spray-equipped double-deck Ripl-Flo screens. These extract and wash the minus ¾-in. plus 4-mesh material which is stockpiled by an 18-in. by 83-ft. radial conveyor. Oversize and undersize are rod mill processed, washed, and classified to supply the medium (minus 4-mesh plus 16-mesh), and fine (minus 16-mesh) sands, which are separately stockpiled by radial conveyors.

The supply of crusher fines making up the minus 4-mesh portion of the plant output averages about 90 t.p.h., more than half being in the plus 16-mesh range. However, about twice as much plus 16-mesh is produced as is required in the design sand, while perhaps less than half the required fines in the minus 16-mesh range are available as crusher fines; so the deficiency is made up by grinding.

Since the contractor chose to batch two sands rather than combine and blend, two rod mills were introduced in the circuit for control and flexibility. Marcy peripheral-discharge mills, one 6 by 12 ft., the other 5 by 11 ft., are used in the flow sheet, mechanical splitters feeding to the two ends of each mill. Pulp is returned to the close-circuited screens by Wemco 6-in. sand pumps, all the minus 16-mesh fraction eventually passing to a huge Conveyco size-control tank, followed by a Conveyco dewatering wheel before being stockpiled. The minus 4-mesh plus 16-mesh sand is a screen product, radially stacked for storage and drainage.

The sand department is a flexible and rather complicated circuit which can, at option, reprocess any of the fine sizes to balance output or otherwise regulate composition to meet the Army's rigid specifications. For example, some of the coarser mill product may find its way into the medium sand stockpile if needed, instead of being returned for further grinding; or an alternate circuit can shunt some of the minus 16-mesh crusher fines into the return rod mill for processing, should particle shape be deemed undesirable in laboratory examination.

The Conveyco sand control tank is identical in size (36 ft. 10 in. long and 9 ft. wide) and in most other respects with the one described

The scalping deck on the first screen in the coarse-rock sizing and crushing tower.

in considerable detail in the article covering aggregate production at another Corps of Engineers project, Chief Joseph Dam at Bridgeport, Wash. (See PIT AND QUARRY, February, 1952, pp. 88-92.) It is a hydraulic-sizing "wash box" containing 32 compartments, or pockets, of decreasing height to settle out eight separate fractions. These may be saved, or wasted, as desired; hose valves at the bottom of each compartment are adjusted to blend the proportions as set up by the specifications. The saved fines are combined and dewatered by a Conveyco wheel equipped with rotary-brush bucket bottoms for the vacuum extraction of migratory water before the sand is stockpiled.

Sand specifications call for an average fineness modulus of 2.44, and percentages by weight of the different fractions are nearly identical with other Corps of Engineers regulations, permitting a variance to 5 percent in the coarsest size, but only 1 percent either way in the minus 200-mesh fines.

The six coarse and fine aggregate stockpiles have a combined live storage capacity of more than 15,000 tons and are in line above a 30-in. by 632-ft. conveyor operating in the recovery tunnel, the belt transferring to a 30-in. by 346-ft. inclined conveyor which delivers to the concrete plant. Two Ty-Rock double-deck screens above the batch plant rescreen the four coarse aggregates before these sizes are binned. The fine and medium sands are binned direct, overhead storage totaling 500 cu. yd.

A C. S. Johnson Octobin plant was purchased by the contractor for the Lookout Point job. Two

Radial conveyors build up drainage-storage kidney-shaped piles of finished sand. The piles align with the coarse-aggregate storage, recovery being by tunnel conveyor.

Only about half the required fines in the minus 50-mesh range are crusher produced; so these two mills, at ground level and adjoining the sand plant, grind oversize to make up for the deficiency.

Products of this huge 32-compartment sand sizer are vacuum-dewatered by the partly-enclosed wheel below.

4-cu. yd. Koehring tilting mixers are used. Automatic, individual batch controls and a totalizer which offers 12 mix selections are included. Cement is received by trucks which shuttle back and forth across the river, the receiving point for cement being on a railroad spur on the opposite side of the Willamette. Type II cement and Protex are employed in most mixes.

Specifications call for concrete temperatures not higher than 50 deg. F. one hour after placing. York cooling equipment, which blasts refrigerated air through the coarse-aggregate hoppers, is employed to meet this requirement. The York equipment, housed in an insulated structure adjoining the concrete plant, likewise cools the water to 32 deg. F. Cement and sand are not chilled, but flake ice can be substituted for some of the mixing water in hot weather if necessary to bring placing temperatures down. The air-blast system is reversible to permit heating the aggregates in cold weather.

Tank storage is provided for 126,000 gal. of water for the aggregate and concrete plants. The water is obtained from a sump in the gravel bed of the river by a Fairbanks-Morse 2,000 g.p.m. deep-well pump.

More than 13,500 ft. of Cordura conveyor belting is employed, built to specifications by Raybestos-Manhattan, Inc. Calwico mesh is used on the vibrating screens where woven wire was indicated. Concrete and aggregate plants began operating on regular schedule in the spring of 1951. Aggregate processing is normally a 2-shift operation, with the concrete plant running around the clock.

Besides the dam work proper, the project involves the relocation of 20 or 25 miles of railroad, a couple of new bridges, and the grading and surfacing of about 35 miles of paved highways.

Lou E. Steelman is project manager for the contractor and D. W. Lutes is project engineer. S. T. Brown is the aggregate-plant superintendent, and Jerry Cannon is quarry superintendent.

The interlocked pushbutton control board at the top of the plant, where all operating units are started, regulated, and stopped.

The rail station where cement is received and loaded into trucks for delivery across the river to the concrete plant.

TRADE CONVENTION EXPENSES ARE TAX DEDUCTIBLE

By HAROLD J. ASHE
Tax Counselor

ALL of the legitimate expenses incurred by a taxpayer in attending a convention of his trade are income tax deductible. Nevertheless, a good many businessmen, because they are away from the business, neglect to treat convention outlays as a business expense. They fail to enter such expenses on their books upon their return home. Not a few taxpayers are still unaware that such expenses are tax deductible. Sole proprietors, co-owners, and those operating as family corporations are disposed to consider it immaterial whether such expenses are reflected as business expenses or not. However, tax-wise, it can be expensive to overlook such charges.

Even though a taxpayer's taxable income is entirely in the lowest tax bracket, the cost of attending a trade convention will reduce his income tax by better than $22 for every $100 of convention expense. Or, stated another way, the net cost of attending a convention is only 78 cents for every dollar of convention outlay. Taxpayers in higher income tax brackets will reduce their income tax even more substantially, or have the net cost of convention attendance reduced even more.

Attendance at a trade convention or other trade event is recognized as a necessary business function by the Bureau of Internal Revenue. However, not all expenditures made while at a convention are necessarily tax deductible. The test is whether the particular expense is for business or is purely personal.

Expenses which will not be challenged include bus, train, or plane fare, or the cost of driving a car; hotel or motel bills; meals and tips; and convention registration fees and other necessary charges made on the delegates by the association.

It is advisable to build a record of convention expenses. These may include transportation ticket stubs, receipted hotel bills, and any other evidence readily available to support (1) the fact that such a trip was made and to indicate (2) the number of days away from home. Ordinarily, receipts are not available for meals, tips, and similar items. However, the receipted hotel bill will support unreceipted meal expenses if the latter are within reason. That is, if a hotel bill shows a three-day stay, this will indicate the purchase of eight or ten meals, plus meals en route.

Even if a taxpayer has already attended a trade convention and has failed to record his expenses for purposes of tax deduction, it may not be too late to reconstruct a partial record and make a close estimate of actual outlays. While the Bureau of Internal Revenue generally insists on receipts and other evidence of expenditures, it may accept a "guesstimated" outlay if it appears to be conservative and there is some evidence that such a convention trip was actually made. At worst, the expense may be partially disallowed, so it is worth reflecting the expense in the income tax return. The sooner such a taxpayer tries to reconstruct his convention expenses, the more likely he is to have his estimate accepted without challenge.

An especial effort should be made to separate purely personal outlays from necessary business expenses incident to attending a convention.

In the former category would be theatre tickets, night club expenses, and liquor bills.

If a taxpayer's wife attends a trade convention, her expenses may or may not be deductible, depending upon her relationship to the business. If she is an active partner in the business, or works in it, her expenses are deductible for tax purposes. Otherwise, they are not. In the latter event, only a part of the total expenses of the taxpayer and his wife will be tax deductible. Care should be taken then to segregate the husband's expenses from those of the wife. Thus, if a hotel room rents for $7 single or $10 double, $7 would be a legitimate business deduction for the husband. Meal expenses, preferably, should be kept separately, making a division between those deductible (the husband's) and those non-deductible (the wife's).

As soon as actual or estimated convention expenses are determined, an entry covering the deductible total should be made in business expense records, so that the expense will show up automatically at income tax filing time. Such an entry should be back-stopped by a memorandum listing a break-down showing how the expenses were distributed, and should be further supported by all available receipts.

Pyro Processing

(*From page* 102)

an enlarged hot zone cause less damming or surging of material higher up in the kiln. It is also pretty well established that rings do not form as easily, nor retain their keys as readily in large-diameter kilns as they do in the smaller sizes. In fact, the combination of the compound flame of relatively long and uniform diameter in an enlarged combustion kiln zone effectively inhibits impingement and ring formation. In all cases a process engineering analysis will determine what combination of design and what operational changes are required to achieve smooth and efficient kiln performance under each set of local conditions. In an existing installation the expedient of reducing lining thickness, along with shell heat transfer control and compound flame, can materially improve operation, while in a new installation, considerably more can be accomplished.

SUMMARY

The rotary kiln has been designed, heated, and operated along more or less standardized lines. Much copying has been done despite the fact that materials, ores, and process requirements vary widely. This has been true especially with smaller operators building their own plants or buying equipment from fabricators who do not have process engineering backgrounds. Frequently such practices have led to indiscriminate kiln applications resulting in operations ranging from smooth and automatic to troublesome and manually-controlled systems. Our shortcoming in this respect is not in the use of the rotary kiln itself for the process purpose, but rather in our reluctance to bring out specialized rotary kiln designs to handle specialized process conditions. The rotary, saddled with sensitive, heat-sticky materials, needs to be operated and designed with specially-developed control provisions, just as is true of the dryer, crusher, grinder, or separator, that must handle sticky, agglomerating materials. Certain factors have been demonstrated to improve operation with such materials, whether they be cement clinker, clay or shale expanded aggregate, phosphate ore, iron ore, high-temperature refractory aggregates, or others. Whether they are required altogether or only in part, the following recommendations may be considered:

Operation

1. Graded particle size of feed (possible pelletizing of excess fines)

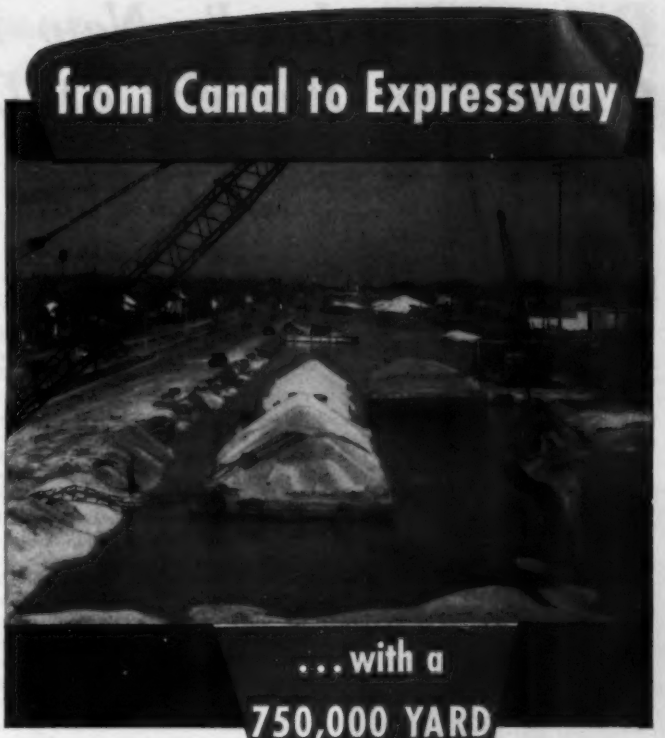
2. Maintenance of minimum kiln bed depth
3. High peripheral kiln speeds
4. Compound flame firing (different from dual flame firing) using controlled heat release over full length of fusion zone
5. Measurement and control of each end of the hot zone lining temperature and shell temperature outside
6. Fullest knowledge and control of trained firemen over flow and quality of feed, B.t.u. input, and primary and secondary air to burners and kiln.

System Design

1. Kiln positioned and designed for high speed and flat pitch
2. Kiln with enlarged hot zone section past longest flame tip
3. Air-cooled, finned, and jacketed hot zone shell with automatic stack or fan draft air-flow control
4. Dual burners turret-mounted with pushbutton control for aiming and with adjustable flame shape (without fuel changes or air volume changes), and capable of producing a long, narrow compound flame of uniform diameter
5. Incorporation of refractory heat exchange and mixing spiral in the calcining zone for certain compounded or wide size-range materials
6. Use of relatively thin refractory hot zone lining adapted to hold a stable coating under the particular fluxing conditions to be encountered.

These operational and design changes, specialized as they may seem, should in most cases accomplish the following: improve temperature uniformity throughout the kiln bed; produce higher heat transfer and longer exposure to radiant heat for lowered operating surface temperatures; produce cooler lining and more positive control over scale or coating thickness; and inhibit localized balling and ring formation and agglomerating tendencies. All have been individually proven in practice and under separate conditions and installations; yet it is in the carefully engineered and chosen combination of most of them applied together to a particularly troublesome pyro-processing condition, that major and positive improvements will result and such a rotary kiln system will be set apart as a specialized installation. We must divide rotary kilns and systems into at least two major classes — (1) agglomerating-fusible and (2) free-flowing non-fusible hot zone operation—and design and operate them differently.

(To be continued)



The same undiminished closing power that has made Owen Buckets the number one choice for difficult "digging" is incorporated in rehandling buckets with larger, wider opening shells that take tremendous grabs in sand, gravel, refill earth and other loose materials.

Expert engineering utilization of this Owen principle of power application, based on unprecedented specialized experience, has made Owen the first and best known name wherever grab buckets are used.

Outstanding performance was doubtless a factor in selecting Owen buckets for this tremendous filling operation being handled at New Orleans by Jahncke Service, Inc. They'll do a job for you, too. Get the Owen Catalog.

Dewey Portland's New Kiln Jumps Output 40 Percent at Dewey, Okla.

By WILLIAM M. AVERY

ON THE SPOT

ANNUAL production at the Dewey, Okla., plant of Dewey Portland Cement Co. moved into the 2,000,000-bbl. bracket with the completion last year of a 9-ft. 6-in. by 375-ft. rotary kiln installation. The additional capacity of about 90 bbl. per hr. amounts to an increase of 40 percent or more in the net output of the plant.

The installation is noteworthy in that it required absolutely no changes or additions to other operating departments in the plant. By operating additional hours, both the raw grinding and finish grinding departments were well able to handle the increased loads imposed by the new kiln, and even reserve coal mill capacity was available for firing the new unit. Increased power requirements were anticipated in connection with a major modernization and expansion program, which will be discussed later in this article.

Since the new kiln was built and placed in service without the involvement of other departments in the mill, it can also be shut down without in any way affecting other operations. Thus, if there should be a period of slack demand, production can be curtailed by merely shutting down the new kiln, allowing the remainder of the plant to operate as before. Since all power requirements are met by utilizing waste heat from the six older kilns, the new kiln is also entirely independent of the power plant.

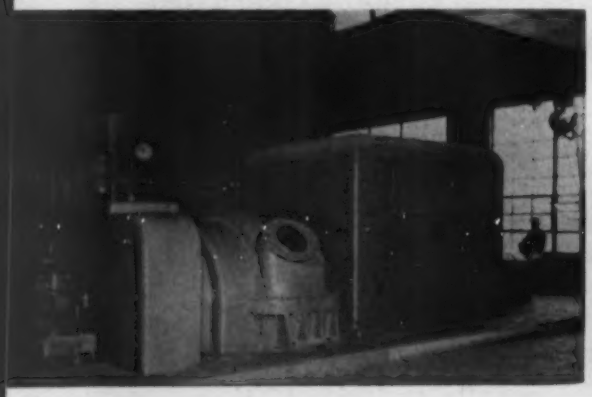
The new kiln was rebuilt from units used briefly for aluminum production at East St. Louis during World War II, consisting actually of one complete 250-ft. kiln and a 125-ft. section of a second kiln. The original kilns, some of which were reassembled in the same way for the Halliburton plant at Corpus Christi, Tex., were manufactured by Traylor.

The entire kiln and all the appurtenant equipment, including the clinker cooler, are located above grade in order to eliminate the construction of foundation pits and the attendant nuisance of pumping. At the low end the centerline of the kiln is 28 ft. above grade, while at the No. 6 pier the centerline is over 44 ft. above the level of the surrounding grade.

The kiln is driven at a top speed of 65 revolutions per hr. by means of a 100-hp. wound-rotor motor, through Texrope belts, a Falk speed reducer, and a conventional girth gear and pinion assembly. This three-speed-control motor also drives an a.-c. generator which supplies power for and automatically synchronizes the raw feed motors.

Like the older kilns, the new unit is fired with coal which is prepared in a central pulverizing plant. Installation of a new 15-t.p.h. Raymond high-side roller mill several years earlier had created enough reserve capacity to take care of the increased demand. The plant is also served by three older mills of the same make which have a capacity of 5 to 6 t.p.h. each. The coal is pumped from the preparation plant to a storage tank ahead of the kiln by means of an 8-in. Fuller-Kinyon pump. A No. 16.25-44 Bailey coal feeder, driven by a 3- to 5-hp. d.-c. motor, feeds the coal into the kiln. The storage tank holds a 10- to 12-hr. supply of fuel.

• A general view of the most recent rotary kiln installation at the Dewey, Okla., plant of the Dewey Portland Cement Company.



• Below, left: The new 5,000-kw. 12-stage turbine has brought the power plant abreast of general plant requirements.

• Drive motors on the 8-pocket rotary feeders for the new kiln are synchronized with the speed of the kiln.

Company has expanded and modernized power plant and electrical distribution system

The raw feed bin ahead of the kiln holds about 350 tons, or a 12- to 14-hr. supply of raw mix. A 10-in. Fuller-Kinyon pump transports the material through an 8-in. line which is suspended from cables between the blending tanks and the kiln feed bin. Feed to the kiln is by means of either of two St. Regis 8-pocket rotary bin feeders, which are synchronized, as explained above, with the kiln speed. One of the feeders serves as a standby unit.

The kiln operates on induced draft supplied by a double-inlet Green Fuel economizer induced-draft fan driven by a 200-h.p. G. E. motor. This unit has a capacity of 142,000 c.f.m. at 495 r.p.m., but the speed has been reduced considerably. Two groups of eight Buell cyclone dust collection cones, arranged in parallel, are located between the induced-draft fan and the kiln. Most of the recovered dust is re-fed to the kiln.

Clinker is cooled by means of a Fuller No. 625 air-quenching cooler, which lowers the temperature from around 2,500 to about 150 deg. F. A part of the hot air from the cooler is tempered with atmospheric air and used for primary air to the kiln, while the remainder is used for secondary combustion. The speed of the cooler is controlled by means of a thermocouple located in the hood. This, and the synchronization of the raw feed drive motors with the speed of the kiln, are the only features of automatic control in the entire installation.

The older kilns in the Dewey plant consist of five rotaries 105 ft. in length with an average output of about 30 bbl. per hr., and one unit 175 ft. in length with an average output of about 45 bbl. per hr. Waste heat from all six kilns is now utilized by means of five 1,100-hp. four-pass water-tube boilers. These units are equipped with Foster Wheeler Economizers and Buell dust arresters located between the boilers and the induced-draft fans. The fans all exhaust into an equalizer flue, which in turn discharges into an 11-ft. inside-diameter by 250-ft. concrete chimney. The chimney was constructed as a part of the overall plant improvement program to serve two purposes: to receive at one elevation the gases from the high-temperature flue running under the first pass of the boilers, and to receive at another elevation (50 ft. higher) the lowered temperature excess gases leaving the boilers.

Built by the Custodis Chimney Construction Company, the stack is lined with 15-in. thick fire brick up to the second opening, then tapers to a 9-in. thick fire brick lining clear to the top. Concrete and brickwork are separated by an air space for the entire height, and there is an additional 9-in. thick fire brick target wall in the bottom 50 ft. A steel cone hopper and a screw conveyor in the bottom of the stack, immediately below the first flue opening, provide for the removal of flue dust.

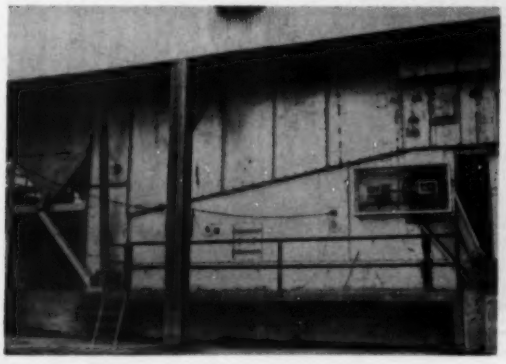
• Charles E. Kietzman, superintendent of the Dewey plant.

In recent years the company has done a vast amount of work to expand and modernize the power plant and electrical-distribution system. Although the plant had usually generated all its own power, it had occasion from time to time to fall back on the limited available supply of Public Service power. The two turbines in service generated 3,000 and 3,200 kw. at 480 volts, and generating capacity had gradually become one of the most serious bottlenecks in the entire plant. Also, due to the inadequate interrupting capacity of existing switching equipment, it had become necessary to purchase power on a regular basis to supply one or two complete powerhouse switchboard feeder circuits.

In order to eliminate this additional operating cost, and to correct

• This power plant building was erected as part of a widespread program of modernization affecting the generating facilities and the entire electrical-distribution system.

• Clinker temperature is reduced from 2,500 to about 150 deg. F. by this air-quenching cooler. Speed of the traveling grate is controlled by a thermocouple located in the hood over the cooler.



several serious faults in the existing power distribution system, a major revamping program was launched several years ago. A careful study of the problem established that most of the load areas in the plant were too far from the generating plant for economical distribution of power at 480 volts. Other considerations, such as elimination of safety hazards and the desirability of using standard switch gear equipment, also favored generating at higher voltage.

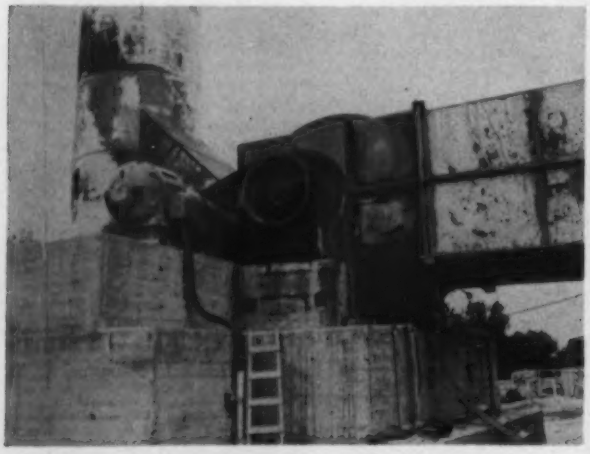
Accordingly, a voltage level of 4,160 volts was selected, the load-center unit substation power distribution plan was adopted, and the plant was divided into seven load areas having about the same connected horsepower. Each substation consists of two 1,500-kv.-a. 3-phase units, so that if one transformer becomes inoperative for any reason the other unit can accommodate the area load for a short period of time.

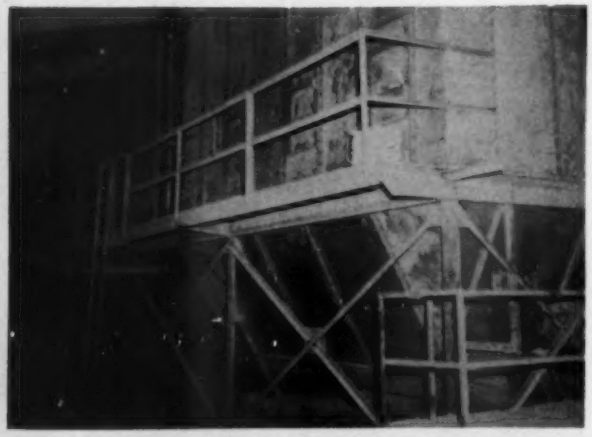
Since existing generating capacity was clearly inadequate, the program necessitated the purchase and installation of a new 5,000-kw., 4,160-volt General Electric turbine generator. The existing generators were completely overhauled and converted from 480 to 4,160 volts, and new excitor generators were direct-connected through flexible couplings to the rotor shafts. Since 8,000 kw. is adequate for present demand, the new generator is synchronized with one of the older units, the other unit serving as a standby. An Ingersoll twin-unit condenser serves the new turbine, and there are three Ingersoll-Rand pumps for the circulating water and two vertical pumps of the same make for the condensate. Except for a small portion which is used for drinking water, all the condensate is returned to the boiler for feedwater.

(*Continued on page* 120)

• **Left: The new kiln operates on induced draft supplied by a double-inlet fan driven by a 200-hp. motor.**

• **Right: Two groups of 8 cyclone dust collection cones are located between the new kiln and its induced-draft fan.**





• **Left: One of the 4-spout packing machines in the new packhouse for masonry cement. Note the bin control devices above the operator. Right: One of the 40-ft. automatic bag-type dust collectors recently installed in the finish mill.**

Michigan Sand-and-Gravel Producer Reclaims "Lost" Land from Pits

THE reclamation of a worked-out gravel pit into productive farmland by Lyle J. Walker, co-owner of the Lyle J. Walker Sand and Gravel Company, Detroit, Mich., proves that a profitable and attractive landscape can be salvaged from an eye-sore. The foresight and ingenuity in Mr. Walker's policy of land conversion may offer suggestions to other pit and quarry operators for avoiding public criticism of land waste and the possibility of zoning restrictions. At present his firm works two pits—one at Rochester, Mich., and the second at New Hudson, Mich. — having a combined yearly production of more than 350,000 cu. yd.

In addition to his interest in the sand-and-gravel business, Mr. Walker is an enthusiastic farmer, and he keeps a herd of white-faced Herefords on the recently-converted property at Rochester, Mich. When Mr. Walker opens a new pit, he starts his land grading almost immediately after the start of the pit operations. In this way only the first of the top soil removed need be stored, and this is eventually used in the last phase of the reclamation.

As each section of the deposit is worked out, it is converted into farmland. Accompanying photographs illustrate the "before and after" of an area near New Hudson which was formerly the site of one of the firm's plants. The "before" illustration shows a bulldozer, operated by Herbert S. Collins, plant superintendent at New Hudson, leveling off the area which formerly was the site of the plant serving the worked-out pit. As can be seen in the "after" illustration, which shows the most recent area leveled, the land has been seeded to rye as a cover crop; and a part of Mr. Walker's herd is grazing in a pasture nearby. This picture also shows a Bay City shovel, Model 45, removing the last concrete foundation from the truck ramp.

The reclaimed farm area contains two lakes which enhance the natural beauty and usefulness of the property. One of the lakes, covering approximately 10 acres, contains an island which was formed by the dumping of overburden. This landscaping adds to the evidence that a worked-out pit doesn't have to be an everlasting eye-sore. A third illustration shows a part of the reclaimed area which now represents a garden spot adjoining Mr. Walker's residence.

Lyle Walker, who grew up in the sand-and-gravel business started by his father in 1923, reorganized the firm as the Lyle J. Walker Sand and Gravel Co. in 1937, which operates two pits located in the outskirts of Detroit to serve Detroit and the Metropolitan area. Much of the production is now being used on projects for military requirements, while other material continues to take care of regular requirements for housing, road building, heavy construction, and commercial purposes.

During World War II Mr. Walker's program of equipment modernization was interrupted, but as soon as the new equipment was available, it started rolling to the different plants which were located in Rochester and vicinity.

In 1949 he set up an entire new plant with new ideas and new equipment at New Hudson, about 30 miles from downtown Detroit and centrally located to serve a greater area. This pit turns out better than 1,700 yards daily from two plants. One of these plants, producing stabilized road gravel, consists of a Telsmith Model 9B portable screening and crushing plant on pneumatic tires. It is fed by a

• Some of the reclaimed land was made into a garden near the Walker residence.

• A shot taken in the same area, showing leveling accomplished with a portion of the land seeded to rye, and in the distance, the Walker Herefords grazing near a lake.

• The work of reclaiming and leveling begins on one section of the Walker company's operation at New Hudson.

• A view of the portable crushing plant at the New Hudson, Mich., pit.

Bay City Model 45 dragline with a ¾-cu. yd. bucket. It was later determined that a high-lift shovel attachment for feeding the portable plant was more practical in working the high bank of gravel.

The other plant at the New Hudson pit is a stationary setup combining a crushing, screening, and washing plant, designed by Lyle Walker, with the assistance of the R. G. Moeller Company, a Detroit equipment distributor. This plant is an assembly of standard manufactured equipment consisting of six 100-cu. yd. Heltzel circular bins, two Telsmith twin-screw sand classifiers, two 4- by 8-ft. Simplicity triple-deck vibrating screens, one 4- by 10-ft. Simplicity double-deck screen, one 36-in. Telsmith gyrasphere secondary crusher, and a Telsmith 8B gyratory primary breaker.

One of the main features of this stationary plant, according to Mr. Walker, is the belt conveyor for transporting raw material from the gravel bank to the processing plant. This is a Barber-Greene sectional conveyor with a 24-in. belt powered by individual electric motors. The conveyor is fed through a hopper by a Bay City Model 65 with a special long shovel attachment consisting of a 25-ft. boom and a 20-ft. handle. The shovel is powered by a Waukesha 148DK diesel engine and is

(*Continued on page* 120)

• Closeup of the shovel feeding the conveyor hopper at the New Hudson stationary plant.

• General view of the New Hudson stationary plant, showing the conveyor setup for transporting material from the gravel bank to the processing plant.

Report on Current Labor Developments

Wage and Salary Controls Modified

By S. HERBERT UNTERBERGER

Industrial & Labor Economists
Washington, D. C. — Philadelphia, Pa.

THE Defense Production Act was extended so that wage and salary controls continue in effect until April 30, 1953. The new act contains several important amendments.

First of all, the new act states that "no regulation or order shall be issued or remain in effect which prohibits the payment or receipt of hourly wages at a rate of $1 per hour or less". This means that any employees being paid an hourly rate of less than $1 or any job classification carrying an hourly rate of less than $1 may be raised to $1 without securing prior approval of any government agency. Without directly saying so, Congress has indicated that it believes that increases up to the modest rate of $1 per hour are not unstabilizing or else that to permit the correction of such low rates, they are willing to accept any unstabilizing consequences.

The purpose of this amendment is clear enough. Its implications are concerning some businessmen. They are concerned primarily over the fact that Congress has indicated that it regards rates below $1 per hour as substandard. They see in this action the likelihood that Congress will shortly raise the Federally imposed minimum wage to $1 per hour and they expect that henceforth minimum wages established under the Walsh-Healy and Davis-Bacon Acts will never be less than $1 per hour. The principal problem seen by most business men in raising the governmentally approved minimum wage rate is that raising minimums generally requires an immediate or at least ultimate increase in the entire wage structure. What starts out to be a limited and generally desirable move to eliminate substandard wages ends as a general increase in wage rates and labor costs.

The Wage Stabilization Board has not yet implemented the action of Congress by issuing any interpretation of this provision. It is generally expected, however, that increases up to $1 per hour will be permitted over and above any other increases allowable under the regulations of that Board. Related increases in occupations rated higher either will have to be made under those regulations, or special approval will be required.

Second, the new act states that the authority conferred by it shall not be exercised with respect to wages, salaries, or other compensation of persons employed in a small business enterprise, which is defined as "any enterprise in which a total of eight or less persons are employed in all its establishments, branches, units, or affiliates". This exemption goes into effect on July 29. The President is given the right to exclude from this exemption such enterprises on the basis of industries, types of businesses, occupations, or areas if their exemption would be unstabilizing with respect to wages, salaries, or other compensation, prices, or manpower. This right to reimpose wage and salary controls on small businesses may be used in the case of tool and die shops or other groups affected by a severe labor shortage, particularly where some of the businesses are small enough to qualify for the exemption and can thereby offer far higher wages than the somewhat larger competing establishments.

The third significant change in the new law is the exemption from salary controls of professional engineers employed in a professional capacity, professional architects employed in a professional capacity by an architect or firm of architects, and certified public accountants licensed to practice, for example, those employed in a professional capacity by a certified public accountant or a firm of certified public accountants.

This exemption resulted primarily from the very serious shortage of engineering personnel and the pressure of employers who were unable to hire sorely needed engineers because their established salary rates were not high enough to attract them from their current employment. Once this exemption was included in the law, the Salary Stabilization Board has sought to limit its application as much as possible by issuing various warnings and interpretations. Thus, that Board warned that an increase in the salary of a professional engineer will not be regarded as a valid basis for a claim to raise the rates for related positions so as to restore customary or historical relationships. It was pointed out that increasing the salary of a professional engineer might destroy not only the differential between the engineer and those whom he supervises but also, going up the salary scale, it might destroy the historical relationship between the engineer and his supervisor. Or even going across the board, it might destroy the customary relationship which has been maintained in position classifications of other types of employees.

In defining a professional engineer the Board insists that he must render specialized or creative services or that he must hold an engineering degree or a professional engineer's license. It carefully spelled out persons who are not professional engineers. Among this group it included technicians or artisans, no matter how skilled; advisers on sales promotion, business methods and operations; and stationary engineers; maintenance engineers, sales engineers, management or administrative engineers; physicists; chemists; mathematicians or other persons professionally employed in scientific fields; persons employed as engineering aides, junior engineers, or other engineering personnel who may work in close association with professional engineers.

Finally, the new Act abolishes the present Wage Stabilization Board as of July 29, 1952, and limits its function up to that time to disposing of the cases before it. It is prevented from issuing any further regulations or orders which would have general application. This limitation was probably designed to prevent the present Board from issuing regulations permitting general wage increases on some new basis.

The new Wage Stabilization Board which is to take over will have no power to recommend terms of settlement in a labor dispute. It will be remembered that the labor members of an earlier Board demanded that the Board have dispute powers as the price of their cooperation. It is expected that when this power is lost, the labor members may again refuse to co-operate. Should this occur, the administration of wage stabilization will not stop as it did previously, but now that many of the wage stabilization policies have been established, they will probably be administered directly by Roger Putnam, the Economic Stabilization Director.

The Bessemer Limestone & Cement Co., Bessemer, Pa., has received a DPA certificate of necessity for $620,222 for facilities to produce fluxstone.

• Above: A single fixed hoist tips the load of each trailer into the hopper of the primary crusher.

• Left: The 2½-cu. yd. shovel loading rock into one of the truck-trailer combinations.

Union Lime

(*From page* 106)

veyor belt to the secondary and tertiary crushing operations for eventual cement production. (See Schoonover, H. E., *New 3,600 Bbl. Per Day Cement Plant in South Africa Begins Operations,* PIT AND QUARRY, October, 1951, page 94.)

Total output of the company's plants has more than trebled since the addition of the truck-trailer combinations, officials point out. In addition, average cost of delivering each ton of crushed stone to the factories has been reduced proportionately to 1.25 shillings per ton. Operating costs of the vehicles are kept low, with each one consuming only £18 worth of fuel in a 252-hour working month over a distance of 1,500 miles. No major repairs have been necessary to date, and minor repairs have been made on fuel pump kits and bendix drive springs only.

In addition to the Johannesburg area gold mines, the Union Lime Co., Ltd., also supplies lime and lime products to water filtration plants and sugar refineries throughout the province of Natal. Its deposits, which have been worked for 12 years, are noted for their purity—as high as 98 percent in some places—which greatly simplifies the extraction of lime from the rock. More than 90,000 tons of rock are dislodged each month by blasting.

Dewey's New Kiln

(*From page* 116)

Other work done in connection with the power plant included a building addition to house the new turbine and the construction of a 150- by 400-ft. spray pond. The Crosby Construction Company acted as general contractors on the power plant project, with the Kelso-Burnett Company of Chicago, the Keener Electric Company of Bartlesville, Okla., and the Houston Pipe & Supply Company of Houston, Tex., serving as subcontractors for various portions of the work.

During the past several years the company has done a considerable amount of work on dust control in the Dewey plant. When the bagging departments were revamped in 1948, five Sly collectors were installed—three in the packhouse for regular cement and two in an entirely new department for handling masonry cement. In 1949 and '50 five new collectors, all Norblo bag-type units, were also installed in the raw and finish mills—one 20-ft. collector in the raw section, and two 20's and two 40's in the finish mill.

The new packhouse for masonry cement provides facilities for loading four cars without shifting, a provision which materially improved the overall shipping problem in the plant. This plant has two No. 150 St. Regis 4-spout automatic packers, and each supply tank is vented directly to a Sly dust collector. It is served by a separate and independent transport pipeline to prevent contamination. The storage system for finished cement of all types consists of 28 silos with a total capacity of about 500,000 bbl. The first four units, built in 1912, are believed to have been the first cement storage silos ever built of concrete.

The Dewey Company was founded by the late D. W. Tyler and his sons, H. F. and F. E. Tyler, in 1906, when Oklahoma was still Indian Territory. In 1907 the Dewey plant produced the first portland cement manufactured in Oklahoma. In 1916 the company purchased a site for a second plant at Davenport, Ia., but construction wasn't started until 1926. This is a wet process plant.

The company's main offices are in Kansas City. F. E. Tyler, one of the three original founders, is chairman of the board, W. E. Tyler is president, and D. M. Tyler is first vice-president and general manager. There are two general sales offices, one at Kansas City, where Walter Gray is vice-president and sales manager, and the other at Davenport, where L. I. Capen is vice-president and sales manager.

During periods of peak operation the Dewey plant employs around 300 men. Charles E. Kietzman is plant superintendent, Ed. F. Sharpton is assistant superintendent, and John Myers is chemist.

Walker

(*From page* 118)

mounted on 34-in. crawler shoes. Two important considerations dictated the use of the long shovel attachment. In working a deposit of this kind it is desirable to permit the bank to cave in rather than have it dragged down by another machine at the top of the bank.

Mr. Walker reports that from one to two hours were lost daily when the old conventional machine became buried in cave-ins and had to be dug out. With the new unit's

long boom and sticks the shovel can dig the high bank from a greater distance with safety. It is also possible with the long shovel attachment to cover a larger work area before it becomes necessary to move the feed end of the conveyor. Excess material from the processing plant is stock-piled and rehandled by another ¾-cu. yd. Bay City Model 45 and an Osgood, which load into trucks for prompt delivery.

Japan—Dolomite Clinker

(*From page 94*)

shown in the illustrations on page 94.

Conclusion—In view of the present international situation, as well as from the viewpoint of a self-sustaining economy, utilization of dolomite as a basic refractory in the iron and steel industry in Japan is of the utmost importance. Our Tochigi plant is located in the midst of the richest and largest dolomite-producing area in Japan. This favorable factor, augmented by modern production facilities and skilled manufacturing technique, backed up with long experience, has resulted in turning out dolomite clinker of a very superior quality. This fact is attested to by the completely satisfactory results obtained in its use as basic refractory in both open-hearth and electric furnaces in various leading steel mills in Japan. Research work is continuing in the plant's experimental laboratory to produce an even better and more stable product and in realizing our goal it is our ardent wish to make a worthy contribution to the steel industry of Japan.

Table 6. Pyrometric Cone Equivalent

Kinds	SiO_2 and Fe_2O_3 in Clinker		Pyrometric Cone Equivalent	
	SiO_2 (%)	Fe_2O_3 (%)		
C_1	3.38	5.60	S.K.	38
C_2	3.68	6.14	S.K.	38

Volume on Weights, Measures Issued by Standard Bureau

Federal and State Weights and Measures Laws (through 1949 enactments), is a newly published compilation of weights and measures laws superseding three earlier volumes on the subject published by NBS in 1904, 1912, and 1926. The information presented, not available elsewhere in a single volume, comprises an up-to-date collection of federal laws and regulations and state laws dealing with the regulatory control of commercial weighing and measuring equipment and practices.

Compiled by Kathryn M. Schwarz under the direction of R. W. Smith. National Bureau of Standards Circular 501, 1182 pages, fabrikoid bound. Price, $5.75 per copy. Order from Government Printing Office, Washington 25, D. C.

personal mention

JOHN BROWN, general sales manager of the National Gypsum Company, recently addressed a merchandising clinic for building materials men held in Springfield, Mass. Mr. Brown outlined the sales and merchandising effort needed in this year in the building materials industry.

WILLIAM F. ATKINS has been appointed district sales manager in Maryland, Pennsylvania and Western New York for Lehigh Materials Company, Lansford, Pa., producers of Lelite lightweight building aggregate, according to an announcement released by Evan Evans, president of the firm.

Mr. Atkins was formerly a buyer and supervisor for the General Electric Company. Previously he was associated with the Goodyear Tire and Rubber Company and the Kelsey Clay Company, Mineral City, Ohio.

HENRY R. BALTZERSEN, controller, Michigan Limestone Division, United States Steel Company, has been elected to membership in the Controllers Institute. Established in 1931, the Institute is a non-profit organization of controllers and finance officers from all lines of business with a total membership of more than 3,700.

GEORGE T. COLLINS has been elected assistant to the president of the Pennsylvania Salt Manufacturing Company, according to an announcement made by George B. Beitzel, president. Previously the new Pennsalt officer was manager of market research and recently has been engaged on special assignments having to do with long-range company planning for the president's office.

Mr. Collins joined the Barrett Division of the Allied Chemical and Dye Corporation, serving first as a chemical engineer in pilot plant work and later as a research group leader in sales development.

In October, 1943, he joined Pennsalt in the market research department. He was named assistant manager of this department in August, 1945, and manager in July, 1946. Mr. Collins is a member of the American Chemical Society, the Chemical Market Research Association, the American Marketing Association, the Chemists Club of New York, the Armed Forces Chemical Association, and the American Ordnance Association.

FRANK E. MCCASLIN, president of the Oregon Portland Cement Company, was recently elected a member of the board of directors of the United States Chamber of Commerce. He will represent district No. 9, comprising Oregon, Washington, and California.

The appointment of SETH T. REESE as chief of the Accident Analysis Branch of the United States Bureau of Mines was announced recently by J. J. Forbes, director of the Bureau. Mr. Reese was formerly a mining engineer in the Health and Safety Division of the Bureau. He succeeds Forrest T. Moyer, who was transferred to the Central Intelligence Agency in April. Mr. Reese will supervise the compiling of accident statistics from the mineral industries, including employment and production data used in studying labor problems and production records.

C. R. Waters

CHARLES R. WATERS of Buffalo, N. Y., district engineer in the State Department of Public Works, recently received an honorary degree of Doctor of Engineering at the commencement exercises of Union College, Schenectady, N. Y.

An alumnus of Union College, Mr. Waters has been serving in his present post since 1926. He is also one of the representatives of the Association of State Highway Officials group which establishes standards for traffic control devices on streets and highways throughout the United States. He is nationally known as an expert on highways and is the author of the "Waters Plan" for regular resurfacing of rural highways.

JOHN C. LAPP, manager of methods and systems for the National Gypsum Company, has been elected president of the Buffalo branch of the National Office Management Association.

The following appointments, made in the interest of current expansion, have been announced by G. G. Robinson, president of Standard Paving and Materials Ltd., Toronto, Canada:

E. Birdsall

E. BIRDSALL has been made vice-president for paving and construction. J. T. MOGAN is the new vice-president in charge of materials, production, and sales. J. H. REID was named vice-president in charge of finance.

J. T. Mogan

J. H. Reid

Standard Paving operates sand-and-gravel plants at Fuller, Paris, and Waterford, Ont.

Effective June 1, 1952, CHARLES H. DICKENS, assistant plant manager at the Waco, Tex., plant of Universal Atlas Cement Company, a United States Steel Corporation subsidiary, assumed the post of general chemist in the New York Office, it was announced by L. M. Funderburg, vice-president, Operations, and F. P. Diener, director of tests and research.

Mr. Dickens has been assistant plant manager at Waco since 1948 and prior to that was chief chemist there for 19 years. He joined Universal Atlas in 1922 at its Independence, Kans., plant, serving there as laboratory assistant and assistant chemist until April, 1929. In that year he was transferred to the Texas plant as chief chemist.

CHARLES R. JERVIS, formerly technical and professional division manager of the Alabama State Employment Service, Birmingham, recently assumed the duties of personnel supervisor of the International Minerals and Chemical Corporation's Florida Phosphate Division in Bartow.

A. A. WAUGH, who had served temporarily as International's personnel supervisor, has returned to his regular post as safety supervisor. L. B. WALKER, acting safety supervisor, was transferred to the industrial relations department.

Two recently announced appointments on the Coplay Cement Manufacturing Company's staff are as follows:

PETER J. LOUGHRAN, vice-president in charge of sales, and ROY W. DIEFENDERFER, assistant to the president.

Irving Crown, executive vice-president of Material Service Corporation, Chicago, recently announced the appointment of WILLIAM F. LANGEFELD to the newly-created office of director of purchasing for Material Service Corporation and its subsidiaries, including the Freeman Coal Mining Corporation and the Marblehead Lime Company. Mr. Langefeld was previously director of purchasing for the Austin-Western Company.

JOHN P. BURROWS has been appointed general purchasing agent for the International Minerals and Chemicals Corporation at Chicago. Mr. Burrows had been assistant general purchasing agent since 1944. He succeeds Joseph M. Coppinger, who died on June 19.

The following changes in executive personnel have been announced for the Glens Falls Portland Cement Company, Glens Falls, N. Y.:

H. E. HARDING has been elected chairman of the firm's board of directors. DWIGHT A. SYMMES was named president. Headquarters of Mr. Harding are at 420 Lexington, New York, N. Y. Mr. Symmes is located at Glen Falls.

ROBERT DOWSE has been appointed manager of Crude Ore Sales at the F. E. Schundler Company, Joliet, Ill., manufacturers of Coralux and various building supplies. He will supervise sales of perlite ore from the Schundler Coralux mines at No Agua, N. M.

obituaries

JOSEPH M. COPPINGER, 60, general purchasing agent of the International Minerals & Chemical Corporation, died on June 19 in a hospital at Clifton Forge, Va. He became ill at White Sulphur Springs, W. Va., on the preceding day.

Mr. Coppinger had been associated with International since 1909 and spent some years in New York and Atlanta. He went to Chicago in 1941, when the firm's general headquarters were moved there.

ALGERNON PATTERSON, 56, a salesman for the McCormick Sand & Gravel Corporation of New York City, passed away unexpectedly on June 2. He was formerly president of the Bronx Building Industry League.

FRANK DONALDSON DE MURGUIONDO, 81, a salesman with the Trinity Portland Cement Company, Dallas, Tex., died recently after more than 50 years in the cement industry. He is believed to have been the first individual to sell Portland cement in Texas. He joined the Texas Portland Cement & Lime Company in 1901. His association with the Trinity organization began in 1924.

WALTER STERLING WING, retired vice-president in charge of sales for the Penn-Dixie Cement Company, passed away recently after an illness of some weeks. He was 67 years of age.

M. FRANK, office manager and bookkeeper for the Muncie Stone & Lime Company, Muncie, Ind., for the last five years, died in that city on July 4. Mr. Frank, who was well known in the stone and lime industries, was 52 years old.

Officials of the Universal Atlas Cement Company of New York, N.Y., have announced the passing of ALAN B. WELLS, retired assistant treasurer and assistant secretary of the firm. Mr. Wells had been affiliated with Universal Atlas for 43 years. Death came on June 21 at his home in East Orange, N. J.

Mr. Wells began his business career in 1898 as a clerk for formative and subsidiary companies of the U. S. Steel Corporation. He joined Universal Atlas in 1909 and was put in charge of the accounting department in the Pittsburgh office. In 1915 he became assistant credit manager and in 1930 assistant treasurer. He was called to the company's New York office in 1936, and subsequently was appointed assistant secretary. Mr. Wells retired from active participation in the company's business in 1946.

LEO SCHUSTER, assistant traffic manager, Universal Atlas Cement Company, a United States Steel Corporation Subsidiary, died on June 25 after a short illness at a Paterson (N. J.) Hospital. He was 61 years old.

Early in his career Mr. Schuster had ten years of traffic experience with several railroads. He joined the Universal Atlas in New York City as a rate clerk in 1918, rising to chief in 1930. In 1946 he was appointed assistant traffic manager. He was widely known in the railroad and traffic fraternity throughout the New York-New Jersey area and had been a member of the Traffic Club of New York since 1945.

BENJAMIN E. SCHROEDER, former auditor of the Universal Atlas Cement Company at Buffington, Ind., died on July 9 in Chicago. Mr. Schroeder was 81 years old.

new machinery and supplies

● Portable Screener and Loader

A portable machine that combines screening, conveying, and loading for sand-and-gravel operators has been introduced by the J. C. Corrigan Company, 41 Norwood street, Boston 22, Mass.

The machine consists of a hopper with a 4-in. grizzly and a slide gate that feeds onto an inclined 24-in. portable conveyor 40 ft. long. The conveyor discharges into a single-deck vibrating screen with two chutes. These deliver the screened material to separate piles or trucks, providing for sand on one and gravel on the other.

For moving, the screen and chutes are removed from the head of the conveyor and the hopper is lifted off the foot. These are transported by truck, and the conveyor is towed on its pneumatic tired wheels.

● Torque Converters

Torque converters can be obtained on six sizes of Caterpillar diesel industrial engines. They are factory installed and range from 70 to 350 brake hp. The engines that can be equipped are the D397, D386, D375, D337, D318, and D315. The converters may be installed with or without a clutch; and other features such as reversing gear and chain housing are available for the smaller models.

The torque converters are Twin Disc models and use ordinary diesel fuel as the hydraulic fluid which may be charged from the engine supply. They are used on the Caterpillar diesel engines made by Caterpillar Tractor Company, Peoria 8, Ill.

● Bit Dressing Machine

An improved bit dressing machine that will dress bits, star bits, reamers, and under diggers up to 12 in. in diameter without the need of hand turning has been brought out by A. W. Mitchhart, 303 W. Market Street, Tiffin, Ohio.

The machine dresses the face of the bit with a forging die, and then side hammers dress both sides simultaneously. Size is controlled by automatic stops on the dies, and an attachment can be obtained for dressing out water courses.

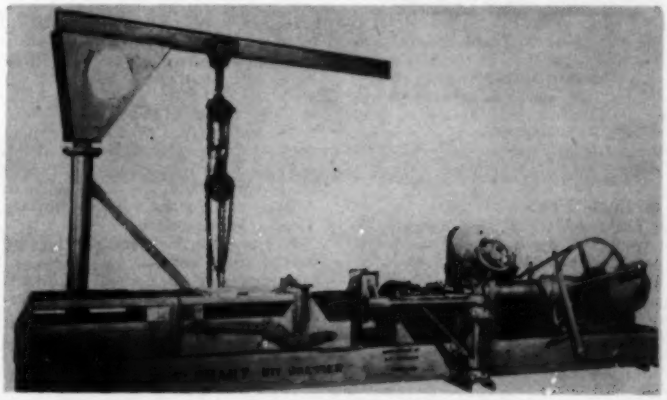
The machine can strike any blow from a light tap to one of 1,800 lb. force, without changing the speed. All shafting is carried on self-aligning ball bearings, and power is supplied through V-belts. The machine is self-contained and may be used in the shop or the field. Gasoline, electric, or any other type of power may be used to operate the dresser.

● Heating Mat

A rubber mat with built-in radiant heating has been developed by the Mechanical Goods Division, United States Rubber Company, Rockefeller Center, New York 20, N. Y., It is being marketed under the name "Uskon".

The heater looks like a rubber floor mat. The center, however, consists of electrically conductive rubber which constitutes the heating element. It operates on 110-volt current and can be plugged into any convenient outlet. The heater normally develops about 35 degrees temperature above the surrounding air, which provides comfort without becoming noticeably hot. The rubber used is especially constructed for toughness.

These heating mats have been tested in mine locomotives, crane cabs, and at machine operating stations in unheated places.



● Rear Dump Wagon

A hydraulically-operated rear-dump wagon has been added to the line of the LaPlante-Choate Manufacturing Company, Cedar Rapids, Ia.

The "TR200" motor wagon is powered by the same unit that powers the TS200 motor scraper and is interchangeable with it. The body tilts to a 70-deg. angle for discharge of the loaded material. The construction is double type, with oak plank fillers to absorb shock loads. Speed is up to 22 m.p.h.

The T200 tractor unit is available with choice of diesel engines, either a 165 hp. Cummins or a 176 hp. Buda. Four-wheel air brakes give positive control. An all-steel cab provides operator comfort and protection.

● Safety Helmet

Safety helmets of Fiberglas for use in mines, quarries, and plants where there is danger of falling materials are being produced by the Industrial Products

Company, 3044 N. Fourth Street, Philadelphia 33, Pa.

The helmets are said to meet all government test specifications and are designed to allow for variance in head shapes. Accessories such as chin straps, winter linings and lamp brackets are available.

● Rock Tire

The Frank G. Hough Company, Libertyville, Ill., has announced that heavy-duty, rock-type tires in a 13:00 X 24, 16-ply size is available as optional equipment on Hough Payloaders used in quarrying and mining service.

This 16-ply tire replaces an 18-ply and is being made by leading tire manufacturers at the request of the F. G. Hough Company. The 16-ply tire will fit the standard 24-in. drop-center rim used with grader-type tires and will eliminate the need for special wheels to use a rock-type tire. In addition to the savings in eliminating special wheels, the new 16-ply tires cost less. It is expected that it will be available on the market from tire dealers very soon.

● Renewable Bucket Teeth

Clamshell buckets can have renewable teeth attached to them, according to information from the Blaw-Knox Company, Bucket Department, Farmers Bank Building, Pittsburgh 22, Pa.

The renewable teeth consist of a base

which is bolted to the bucket lip and a cutter that wedges into the base. The cutter is reversible and can be tapped out and a new one inserted. As only the cutter is replaced, changing time is greatly reduced and maintenance costs are lessened. Bases are already drilled for bolts for most of the company's buckets, but additional ones are available for drilling where necessary.

● Simplified Hose Types

Thermoid Rubber Company, Trenton, N. J., has announced the simplification of its molded hose line from 18 to 5 basic types. These are being made in different colors to assist in identification. These types are as follows:

Red covered "Versaflex" for pressure to 800 p.s.i., handling air, water, and petroleum products, as well as butane, propane, and sprays; "Versicon", brown-covered, for nearly all industrial applications up to 300 p.s.i.; the "Aquair" type for air, water, oxygen, and acetylene, with pressures up to 200 p.s.i., cover, green; "Utility", a general-purpose hose for water and air, with working pressure to 125 p.s.i., black and "Powerflex" a steel braided hose for steam service up to 200 p.s.i.

● Pump Primer

An inductor for priming above-water-level centrifugal pumps which are not self-priming has been developed by Nagle Pumps, Inc., 1249 Center Avenue, Chicago Heights, Ill.

The "Nagle Priming Inductor" is coupled to the entrance pipe of the pump. A supply of water of sufficient capacity and pressure must be piped to it. Ordinary city pressure generally suffices. It is essentially a water-operated jet that fills the entrance pipe and pump

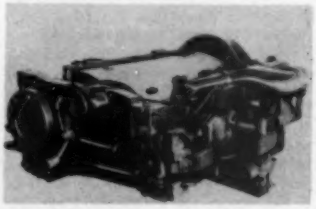
with liquid to initiate the pumping. The inductor does not retard suction after the pump is operating. There are 13 sizes to fit entrance pipes from 1½ to 18 inches. While primarily designed for clear liquid service, the inductor has been used in connection with pumps handling ashes, sand, and other solids.

● Horizontal Diesel Engine

A horizontal diesel engine designed for utilizing underfloor space in buses and railcars has been announced by the Cummins Engine Company, Columbus, Ind.

The new engine, "NHHB-600", is full diesel, 6-cylinder, and produces 200 hp. at 2100 r.p.m., with a compression ratio of 15.5 to 1. Bore and stroke are 5⅛ by 6 in., and weight is 2285 lb.

The engine is approximately 64 in. long, 55 in. wide, and 23 in. high.



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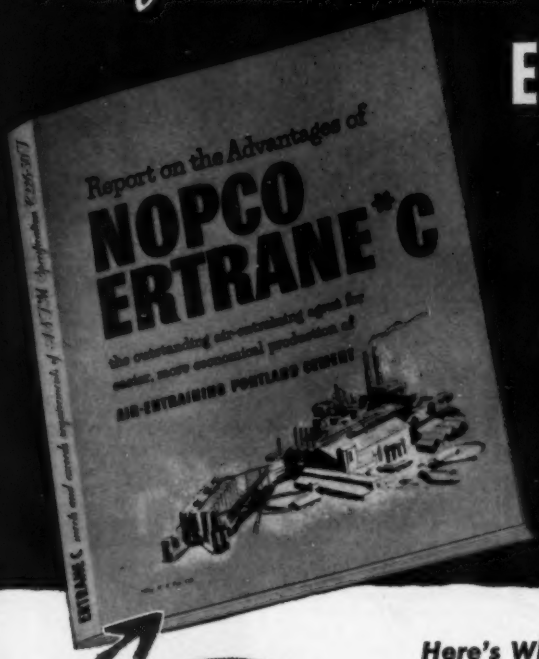
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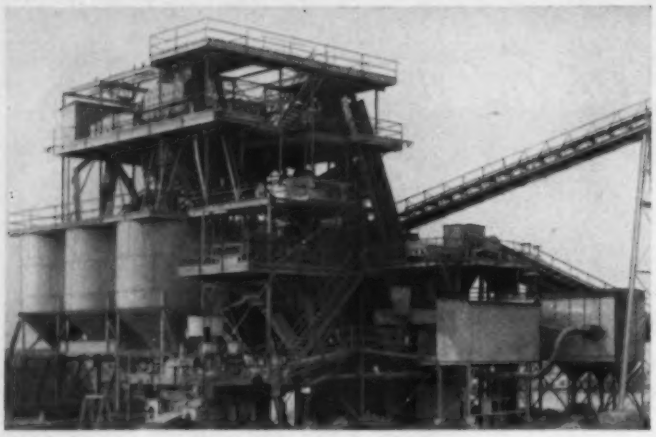

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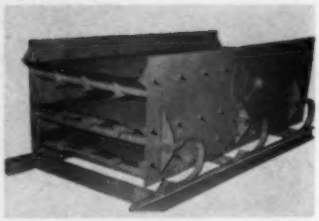


● Vibrating Screens

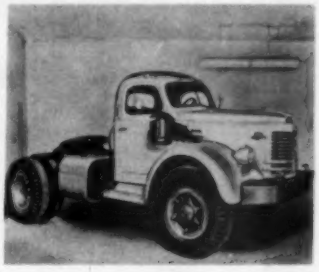
A line of larger size vibrating screens has been announced by the Kolman Manufacturing Company, Sioux Falls, S. D. The new screens are being made in 3- and 4-ft. widths and 8-to 10-ft. lengths in multiple deck units. A single-deck unit 42 in. in width and up to 7ft. long has also been added.

The "Series C" multiple-deck units feature a parabolic deck design, heavy-duty springs and bearings, compact design, and rugged construction. They are built for screening crushed stone, sand, gravel, agstone, clay, coal, and many other materials.

● Lightweight Truck-Tractor

A lightweight, high-speed truck-tractor powered by a diesel engine has been announced by Reo Motors, Lansing 20, Mich. The new model is the "F23DT", which is powered by a Cummins JBS-600 diesel engine.

The new model, complete except for fifth wheel, weighs about 9,500 lb. It



has a gross rating of 50,000 lb. and a 130-in. wheelbase. The engine develops 150 hp. at 2,500 r.p.m. and 360 ft.-lb. of torque at 1,400 r.p.m. A Timken two-speed double-reduction axle is used which has been designed to reduce weight. A Clark 292 VO transmission with overdrive is standard.

● Anti-Rust Paint

A paint especially for direct use over rust (no wire brushing or sandblasting needed) is being sold under the name of "Overust." It is composed of a menhaden vegetable oil base and special chromate pigments.

The paint is said to be able to penetrate, prime, and seal all metal surfaces with one coat. The chromates in the paint are claimed to have great affinity for metal, tending to stop the most severe cases of rusting and to resist the attacks of moisture, chemicals, fumes, and acids. Overust paint in clear and colors is being produced by Chem Industrial Co., 3784 Ridge Road, Brooklyn 9, Ohio.

trade notes

The GMC truck dealership at 603 West 23rd St., New York City, has been sold to the newly organized Farley-GMC Truck Co. Inc., with James A. Farley, former U. S. Postmaster General, as president.

The newly-franchised dealership will take over the existing real estate facilities and inventories.

Willard Walker has been appointed vice-president and general manager of the company. He was executive vice-president of the Brunswick Ordnance Co., a subsidiary of Mack Truck.

Charles C. Sunderland, chief bridge engineer for the John A. Roebling's Sons Company, Trenton, N. J., has retired after more than a half-century of service. He will be succeeded by Blair Birdsall, who has been assistant chief bridge engineer since 1940.

C. C. Sunderland

B. Birdsall

Considered one of the world's foremost bridge engineers, Mr. Sunderland retires after an active career dating back to 1901, when he began as a draftsman in the Roebling Bridge and Tramway Department.

Mr. Birdsall has managed Roebling suspension bridge and tramway contracts since 1940. They have included the Peace River Bridge along the Alcan Highway in Alaska and the Tacoma Narrows Bridge. A member of the New Jersey Society of Professional Engineers, Mr. Birdsall is a past president of the Engineers Club of Trenton, and this year will serve as a director of the Philadelphia section of the American Society of Civil Engineers.

Pioneer Engineering Works, Minneapolis, Minn., subsidiary of Poor & Company, Chicago, has announced the appointment of Earl A. Lerner as western mines representative to serve the Southwestern states. He has been central sales manager for American Manganese Steel Company, and most recently has been in charge of sales and engineering in southern California for Amsco.

Clarence B. Brown Jr. will direct the activities of the central district office of the Hardinge Company, Inc., 205 W. Wacker Drive, Chicago, Ill., filling the vacancy created by the relocation of Clement W. Ankeny to Phoenix, Ariz.

Worthington Corporation, Harrison, N. J., has announced the appointment of J. P. McArthur as manager of the Philadelphia district sales office, succeeding the late W. J. Daly. Mr. McArthur was formerly regional manager of West Coast sales.

H. W. King, formerly manager of the San Francisco district office has succeeded Mr. McArthur as regional manager, West Coast sales.

P. L. McManus, formerly resident salesman in Portland, Ore., has been appointed manager of the San Francisco district office.

Traylor Engineering & Mfg. Company officials have announced the appointment of Douglas J. Kramm as district sales manager in charge of the Western District. His headquarters will be in the Sharon Building, 55 New Montgomery Street, San Francisco, Calif.

For the last six years he was a sales engineer for the Allis-Chalmers Manufacturing Company in San Francisco.

A paper machine capable of producing 100,000 tons of paper annually has gone into service at the Pensacola, Fla., plant of the St. Regis Paper Company, New York 17, N. Y.

The pulp mill at the plant has been expanded to care for the increased demand and has raised the capacity of the plant to 265,000 tons yearly of paper and paper board products.

The Goodyear Tire and Rubber Company, Akron, Ohio, and the Berry Asphalt Company, Chicago, Ill., have concluded an agreement for the latter to distribute Goodyear's pelletized rubbers. These are used for surfacing playgrounds, walks, crossings, and bridge floors where a resilient, noiseless, waterproof and flexible pavement is needed. Both companies are testing the use of synthetic rubber powder in asphalt mixes for highway construction.

J. S. Bachman

According to a recent announcement made by the Construction Equipment Division, Worthington Corporation, John S. Bachman has been promoted to manager of paver and portable mixer sales at the Plainfield, N. J. works. Mr. Bachman had been a regional manager since 1948.

It was also announced that J. R. Hutchison has been appointed regional manager for the Middle East for Worthington Corporation. He will manage Worthington's activities in Cyprus, Egypt, Greece, Iran, Iraq, Israel, Lebanon, Syria, Trans-Jordan and Turkey.

James E. Curran has been appointed purchasing agent for the J. B. Ehrsam and Sons Manufacturing Company, Enterprise, Kans., according to an announcement made by W. J. Ehrsam Jr., president and general manager.

Richard N. Benson, Peter D. O'Neill and Stephen P. Terlecky have been named field engineers for the Republic Rubber Division, Lee Rubber & Tire Corporation, Youngstown, Ohio.

Mr. Benson and Mr. O'Neill have been assigned to the Chicago district office. Mr. Terleck has been assigned to Philadelphia district office.

All of the new field engineers have been promoted from sales trainees. They were the first hired under the new sales training program.

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G. E. Jarpe

The establishment of a new district office in Duluth, Minn., has been announced by the Nordberg Manufacturing Company, Milwaukee 1, Wis.

In establishing this office, Nordberg has transferred G. E. Jarpe, district manager of the Spokane, Wash., office to the new Duluth headquarters, where he will serve in a similar capacity. Mr. Jarpe joined the firm in 1942.

T. D. Cartledge

Thomas D. Cartledge has been appointed president of Linde Air Products Company, a division of Union Carbide and Carbon Corporation, it was announced recently. He has been senior vice-president of Linde Air Products and a director and vice-president of Dominion Oxygen Company, Limited, a Union Carbide subsidiary.

Mr. Cartledge joined the company after serving in the U. S. Navy during World War I.

The Industrial Safety Equipment Association at the annual meeting, on June 25, 26 and 27 at the Homestead, Hot Springs, Va., elected Edison L. Wheeler, Wheeler Protective Apparel Company, president.

Elected also at the meeting were S. C. Herbine, Willson Products Company, vice-president; J. B. Davies, Mine Safety Appliances Company, and F. R. Davis Jr., Davis Emergency Equipment Company, trustees.

Executives of the Smith Engineering Works, 532 E. Capitol Drive, Milwaukee 12, Wisc., have announced changes in the firm's engineering department.

Alexander L. Munro, who has been chief engineer, has been advanced to the position of director of engineering. He is also secretary and a director of the company.

Elmer E. Kraig, formerly assistant chief engineer, has been advanced to the position of chief engineer.

Schaeffer E. Specht has been appointed executive sales engineer by Research Corporation, Bound Brook, N. J. He will be in charge of the New Jersey-Pennsylvania-New York area.

Mr. Specht was formerly plant engineer for C. K. Williams & Company, Easton, Pa., and design engineer for the Penn-Dixie Cement Corporation, Nazareth, Pa. He will specialize in the application of electrical precipitation dust recovery equipment in the cement manufacturing process.

Quaker Rubber Corporation, a division of H. K. Porter Company, Inc., Philadelphia, Pa., has established a branch warehouse and sales office at 430 South Mill Street, Cincinnati 15, Ohio. The new branch is under the supervision of W. W. Hutchinson, who formerly covered the Toledo territory.

A. L. Bard

Sheffield Steel Corporation has announced the appointment of A. L. Bard to the position of manager, grinding media sales, with offices in Kansas City, Mo.

Mr. Bard has been associated with Sheffield since 1938. He was formerly in charge of engineering sales and development of grinding media, and is succeeding George P. Lacy, who has been appointed manager of sales, wire division.

L. F. Cox

Lester F. Cox has been elected executive vice-president and executive manager of the Thermoid Company, Trenton, N. J. A year ago he was named senior vice-president in charge of manufacturing and engineering for the company's seven plants. Now as executive manager he will supervise all divisions of the Thermoid Co.

The new compounding and mixing building at Quaker Rubber Corporation, Division of H. K. Porter Company, Inc., Philadelphia, is now in operation.

The new facilities include the most modern compounding and mixing equipment available and were designed to provide overall increased production and top quality products.

The firm has also opened a new stock-carrying branch warehouse and sales office at 1327 Levee Street, Dallas, Texas.

The new warehouse has 5,000 sq. ft. of floor space, truck facilities, and rail trackage. D. C. Hahn has been named district manager.

Kenneth L. Horgan has been appointed eastern district manager of the Industrial Division, Westinghouse Electric Corporation, Pittsburgh, Pa. Mr. Horgan succeeds J. S. Parry Jr., who recently transferred to East Pittsburgh, Pa., as assistant manager of the Apparatus Division.

Cyril S. Kranick has been appointed sales engineer for the Western Machinery Company, San Francisco 7, Calif. He will service the New England and Middle Atlantic states. His headquarters will be in Dunmore, Pa.

legal decisions

By LEO T. PARKER

Attorney at Law
Cincinnati, Ohio

A few weeks ago the writer traveled in several southern states. As a basis for this article I have selected certain outstanding legal questions presented to be by readers while on this trip.

Insurance Law

A reader asked this important legal question: "Last year an insurance agent came to my office soliciting insurance business. I told him that I wanted all our buildings insured against fire, wind, etc. He promised to do so. When the insurance policy came, I did not read it, and now the insurance company refuses to pay a $10,000 loss of one building which was not included in this policy. As the company's agent promised that he would insure all my buildings, and I can prove that by witnesses, can I sue and recover this loss from the insurance company?"

According to a late higher court decision, the answer is no. This is so because it is important and well settled

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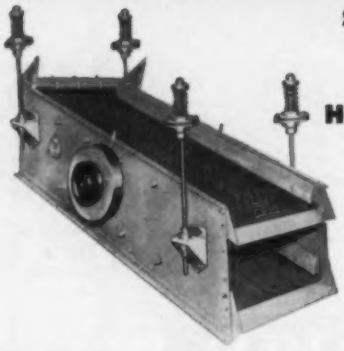

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Notice, on Denver-Dillon Vibrating Screens, that bearings are not anchored to heavy channel iron or other supports. Weight of screen and load is suspended. Bearings support only weight of flywheels and shaft. Screen is free of restrictions to impart maximum vibration to entire screen body.

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law that all higher courts hold that an ordinary insurance agent is an agent of the insured, not an agent of the insurance company, and therefore the insurance company is *not* liable for promises of protection made by the ordinary or special insurance agent. In other words, irrespective of what an insurance agent tells you and no matter what protection he promises, you *must* rely upon the protection offered by the clauses in the policy. See *West v. Employers* 178 S. W. (2d) 168, and Wallace, 55 S. E. (2d) 259.

How to Keep Books

An accountant for a large corporation asked this question: "How can I be certain to collect payment for materials delivered on a large job if the purchaser contests the accuracy of my bills and refuses to pay the account?"

The answer to this question is: The higher courts very consistently hold that books when presented to a court proves the accuracy of the seller's bill, unless the purchaser introduces contradictory evidence.

Generally speaking, in order that a book be admitted in evidence the book must contain the seller's original entries or the first permanent records of the transaction. When the contrary is disclosed upon the face of the books, or is disclosed by testimony, the book will be rejected as relevant evidence. Conversely, books of *original* entry are admissible notwithstanding the fact that the entries therein have been transferred to other books.

Also, it is important to know that if entries were transcribed to final books from a card, or other memorandum in which they were first entered for a temporary purpose, the first entry of the charges is regarded as a memorandum preparatory to permanent transactions, and the entry in the regular or final book of accounts is deemed to be the first and original entry. In other words, if the original record was intended by the seller to be temporary, it is not deemed to be the original, and the book on which the memorandum is copied must be presented in court as evidence of the transaction. Moreover, the temporary memorandum may be made by an authorized employee and afterward entered in the book of original entries, but the testimony must prove that the original notes or memorandums are correct, otherwise the court will not consider as evidence either the original or the final entries.

Another important point of the law is that when an indebtedness exists upon an open account and thereafter the buyer and seller agree that the account is correct, the seller may sue upon either the original account or upon the account stated.

On the other hand, circumstances may exist under which a seller is not compelled to prove positively the exact amounts of materials sold and delivered to a purchaser being sued. This condition may arise when the purchaser regularly receives monthly statements and does not complain that the statements are incorrect. In other words, by failure to complain promptly that a bill is in-

correct, the purchaser impliedly agrees to its correctness.

For instance, in *Welch-Sandler Cement Company v. Mullins*, 31 S. W. (2d) 86, the testimony disclosed these fact: A cement company sold to a contractor thousands of dollars worth of cement. The cement company sent two tickets with the material to the job. One of the tickets was signed by the contractor's representative and returned. The other ticket was left on the job with the contractor's representative who received the material. From the ticket returned to the cement company the account was posted to the ledger sheets after it was extended and proved to be correct. The evidence was clearly to the effect that the cement company's memorandum books were kept in the usual course of business and that the book was a register of the daily transactions of the cement company. Later these memorandums were copied on the company's final books. From time to time monthly statements were mailed to the contractor, who ultimately refused to pay the bill. The cement company filed suit to recover the amount due.

The lower court refused to permit the cement company to introduce as evidence its books because the entries were taken from tickets not proven to have been correct. However, as it was proved that the contractor had received the monthly statements without comment, the higher court held the cement company entitled to a judgement for the full amount of its account, saying:

"There was independent proof of the delivery of the cement. Monthly statements were sent to the defendant (contractor), who did not dispute any of the items shown thereby . . . . He thus admitted not only that the items were delivered but that the charges therefor were correct. . ."

Hence, silence is in many instances construed by the courts as a positive admission, but not always.

Compensation vs. Damages

A contractor asked this question: "What is the important difference between suits filed by employees against their employers for damages and ordinary compensation under the State Workmen's Compensation Act? What I want to know is whether under the same circumstances of an injury an employee can sue for damages instead of accepting compensation under the State Workmen's Compensation Act."

Under federal and state compensation laws employees may recover compensation for injuries and diseases, irrespective of testimony tending to prove that if the employee had used ordinary care, he may have avoided sustaining injury or contracting the disease. But no employee can recover damages from his employer unless he proves that the injury resulted from the employer's negligence.

In other words, federal and state compensation laws are primarily intended to compensate employees for injuries and sickness under almost all circumstances, providing the injury or sickness was sustained while the employee was working within the scope of his employment. But this law is not applicable to suits filed against employers for damages.

For example, in *Barksdale v. Silica Products Company, Inc.*, 137 S. W. (2d) 901, it was disclosed that an employee contracted the occupational disease of silicosis while employed at a silica mine, and he filed suit against his employer to recover damages.

The employer produced testimony showing that a state law provides that an injured employee must file his complaint or suit within three years from occurrence of the injury or disease. Since the employee had not filed a complaint until nine years after his employment had begun and, also, since expert witnesses testified that silicosis is a disease not contracted in *less* than five years, the higher court refused to award the employee damages, and said:

"First, the testimony offered by expert witnesses is that silicosis is a disease which is not contracted within a shorter period of time than five years, and that the average time for its contraction, as shown by the experiments of the Federal Labor Department and Bureau of Mines, ranges from 8 to 12 to 15 years . . . . The great weight of American authority is to the effect that the cause of action arises and the statute of limitations begins to run from the date of the negligent act and *not* from the time the full extent of the injury may be ascertained."

The importance of this decision is apparent when it is realized that legally the date on which a disease is contracted

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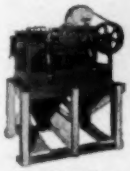
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(Type "J"— anti-friction bearing crusher.)

10" x 24"	18" x 36"
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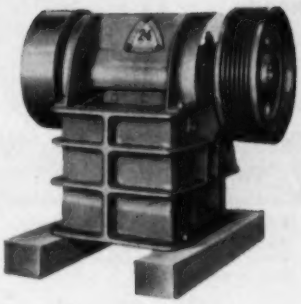
15" x 24"	21" x 40"
15" x 36"	25" x 40"
18" x 24"	32" x 40"



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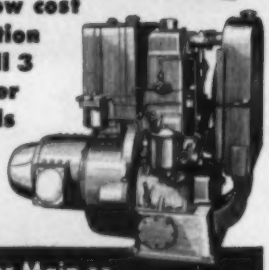

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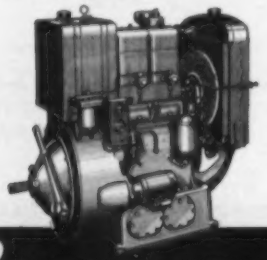

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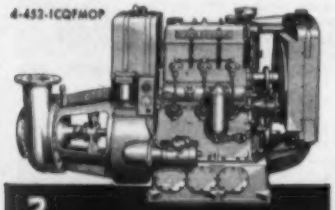

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is *not* the date the employee *realizes* that he has contracted the disease, but it is the date he first became *subjected* to the danger of contracting the disease. Therefore, if state statutes specify that an employee must make complaint, or file suit, within one year from the date of occurrence of an injury, or occupational disease, the employee is without recourse or legal rights in a damage suit if he was subjected to contracting the disease more than one year before he filed the suit.

Another important point of law decided by the higher court in the above case relates to "assumption of risk". The term "assumption of risk" is applicable only where an employee elects to sue his employer to recover damages for an injury instead of accepting compensation specified under the State Workmen's Compensation Act.

Obviously, no employee may be prevented from recovering damages for an injury or illness resulting from negligence of his employer. On the other hand, an employee who performs dangerous work automatically forfeits his right to sue and recover *damages* from his employer, although under the same circumstances the employee can recover compensation under the State Workmen's Compensation Act.

A review of higher court cases disclosed that an employee is *not* entitled to recover from his employer if he is injured (1) while he is acting outside the scope of his regular employment; (2) or while he acts in disobedience to his employer's instructions; (3) or if he fails to use ordinary care to protect himself against the injury; (4) or if he quits his regular work and is injured while performing some act for his own benefit and not associated with the employment; (5) or if he is injured while off his employer's premises without authority.

Wilful Negligence

The higher courts hold that an employee may recover compensation from the State Workmen's Compensation Act for injuries sustained as a result of his carelessness. But an employee cannot receive compensation for an injury sustained as a result of his *wilful* negligence.

For illustration, in *Herman v. Atlanta Sand Company,* 31 S. E. (2d) 100, it was shown that the superintendent of the Atlanta Sand Company was found dead lying over two electric motors in a pump house, with the motor running. The motor operated upon 550 volts of electricity. When found, the superintendent's hands and feet were bare, although both rubber gloves and boots were within accessible distance.

The superintendent's widow filed suit to recover compensation under the State Workmen's Compensation Act. During the trial evidence was introduced proving that the company's officials had ordered all employees to wear the rubber gloves and boots whenever working about the motors. In view of this testimony, the higher court refused to allow compensation to the widow, and said:

"We cannot conceive of any task in connection with starting or operating the electric motor wherein gloves or boots would have been in the way and an obstacle to the decedent."

Must Prove Damages

An official of a sand-and-gravel company asked this question: "How much damages can our company collect if we sue a contractor who signed a contract to purchase 20,000 tons of sand and gravel and cancelled the contract before he took delivery of this amount of material?"

According to a leading higher court, a seller cannot recover damages from a purchaser who breached a sale contract unless the seller actually proves the amount of damages he suffered.

For example, in *Washington Sand and Gravel Company v. Brann and Stuart Company,* 162 Fed. (2d) 826, the Washington Sand and Gravel Company sued for damages a contractor who had cancelled a contract for the purchase of sand and gravel. The testimony showed that the contractor signed a written contract to purchase 10,000 tons of washed gravel and 10,000 of concrete sand at stipulated prices. After only 3,200 tons of material were delivered, the contractor cancelled the contract and refused to accept and pay for the balance. At the time the contractor cancelled the contract, the company had the remaining 16,800 tons of sand and gravel washed and stored in its yard, ready for delivery to the contractor. However, the undelivered balance of 16,800 tons of sand and gravel was sold by the company to other purchasers for 10 cents a ton above

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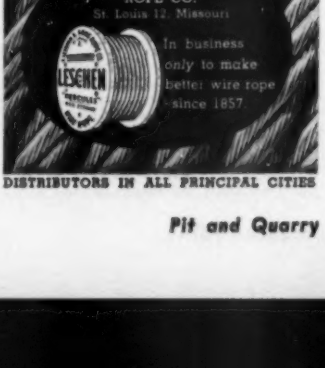

DISTRIBUTORS IN ALL PRINCIPAL CITIES

the price stipulated in the contractor's contract. Therefore the company could not prove how much it had lost financially by the contractor's breach, and the higher court refused to allow the company any damages, saying:

"It is at least open to grave doubt that appellant (company) suffered any actual loss."

On the other hand, modern higher courts consistently hold that a seller may recover *actual* damages resulting from a purchaser's breach of a contract. For example, in one case the court allowed a seller of stone $10,280 damages for breach of a purchaser's contract because the seller proved that he was compelled to sell on the open market at a loss of $10,280 the same stone the purchaser had, under his contract, refused to accept.

Contract Is Severable

An official of a cement company asked this question: "If a property owner gives our company a lease on his land and in the same contract we agree to pay him a specified salary, can we refuse to employ him and still retain our lease on his property? We have such a situation now."

Generally speaking, the answer to this question is no. On the other hand, if the property owner performs an act which justifies the company in discharging him, the company still has a valid lease.

This is so because the general rule of the law is that where two parties enter into one contract for doing several distinct things, the whole contract is not voidable although one or more of the obligations are void. So held a higher court in the late case of *Burkhart v. Brownfield*, 33 S. W. (2d) 885.

The facts of this case are that a company and a property owner entered into a written contract by the terms of which the property owner granted to the company the exclusive right to mine gravel and sand off 18 acres of land for the term of two years. In the same contract the company purchased from the property owner certain equipment which he had used in operating a gravel pit.

Later litigation developed over the validity of the lease and it was contended that if the lease contract was void, the company's agreement to purchase the property owner's equipment also was void. However, the court refused to uphold this contention, saying:

"We think the written contract is clearly severable. The land was merely leased for a limited period; the equipment was unconditionally assigned and delivered; the terms of payment were dissimilar; and the subject matter was wholly different in character."

Hence, if in the same contract, two or more obligations are assumed and one obligation may be performed separately, without regard to the other obligation, a part of the contract may be declared void by the court and another part may be valid and enforceable.

Officials of the American Hoist & Derrick Company, St. Paul, Minn., announced the election of John E. Carroll to the board of directors of the company. He is also vice-president of sales.

Pettibone Mulliken Corporation, Chicago 51, Ill., has announced several changes in its sales organization according to information from J. Malcolm Hume, assistant director of sales.

Arnold C. Lee has been appointed district manager of the Construction Equipment Division for the territory covering Washington, Montana, Alaska, a part of Idaho, and British Columbia, Alberta, and Saskatchewan in Canada. Mr. Lee formerly was sales engineer with the Jeffrey Manufacturing Company.

Alex E. Ainlay becomes district manager of the territory comprising Colorado, Wyoming, Utah, eastern Idaho, and a part of New Mexico. C. W. Stewart, Midwestern district manager, has been transferred to the territory consisting of northern California, Nevada, Oregon, and a part of Idaho.

K. Ray Merrick was appointed district manager of the Midwestern territory, succeeding Mr. Stewart. He will cover Michigan, Indiana, Illinois, Missouri, Kansas, and part of Arkansas. Mr. Merrick was previously associated with the Link Belt Company.

Hudson Pulp & Paper Corp., 505 Park Avenue, New York, N. Y., has announced the establishment of a free package design service to multiwall sack users.

The new department will make a study of a company's packages, sales problems, and competition, and will submit a design to meet the user's specific needs.

The above picture illustrates one of the many ways of applying a Sauerman Drag Scraper in the open storage of bulk materials. Here the scraper stores crushed rock in a high pile covering a large area and then reclaims (as shown in picture) to a hopper at processing plant. The operation costs only a few cents per ton handled.

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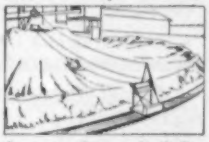
By using a Sauerman machine you can be sure of doing almost any long range material handling job more efficiently and at less cost. That's because it digs, hauls and dumps in one continuous cycle — under the positive control of one operator.

Sauerman Scraper Excavator

Sauerman excavators are classified under two main groups—power drag scrapers and slackline cableways. Either type of machine will span a large area, dig and move material rapidly from point to point anywhere within that area, dump automatically at any designated spot.



Sauerman Scraper Stockpiler

The Sauerman power drag scraper is widely used for general excavating and stockpiling. The slackline cableway is ideal where it's necessary to dig deep, especially under water, and lift to a high delivery point. Both machines are simply designed, easy to operate, low in maintenance as well as power costs.

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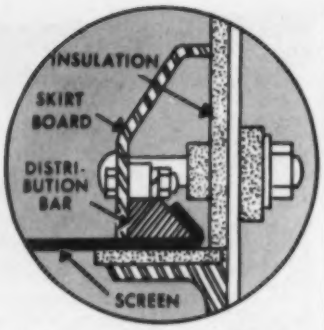

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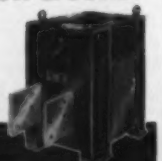

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traffic news

CENTRAL TERRITORY RAILROADS FREIGHT TRAFFIC COMMITTEE

Docket 88936 (1)—Proposed to establish on stone, crushed, in bulk, crushed stone screenings, in bulk, tailings in bulk in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Ft. Wayne, Ind., to New Haven, Ind., 58 cents net ton.

Docket 88937 (1)—Proposed to establish on stone, crushed, in bulk, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Georgia, Ind., to Robinson, Ill., 144 cents; to Paris, Ill., 153 cents net ton.

Docket 88938 (2)—Proposed to establish on stone, crushed, in bulk, crushed stone screenings, in bulk, tailings, in bulk, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical visible capacity, actual weight will apply from Waterville, Ohio, to Kalamazoo, Mich., 215 cents per net ton.

Docket 88941 (1)—Proposed to establish a rate of 161 cents per net ton on crushed stone in open-top cars, minimum weight 90 percent of marked capacity of car from Maumee, Ohio, to Romulus, Mich.

Docket 88945 (2)—Proposed to establish on crushed limestone, carloads minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Thornton, Ill., to Fayette, Ind., 107 cents net ton. To expire with December 31, 1952.

Docket 88946 (1)—Proposed to establish on sand (except blast, core, engine, filter, fire or furnace, glass, grinding or polishing, loam, moulding or silica) and gravel, in open-top equipment, carload minimum weight 90 percent of marked capacity of car except when car is loaded to full cubical or visible capacity, actual weight will apply from Peru, Ind., to New Haven, Ind., 77 cents net ton.

GENERAL FREIGHT TRAFFIC COMMITTEE—EASTERN RAILROADS

Bulletin G-6149 (Shipper)—Proposed to establish on limestone, natural, ground or pulverized, unburned, in closed cars, minimum weight 50 tons from Gibsonburg, Ohio, and other northwestern Ohio group

For *SPEED* in weighing Bulk Materials

ACCURACY in checking weights at any stage

ECONOMY in operation and upkeep

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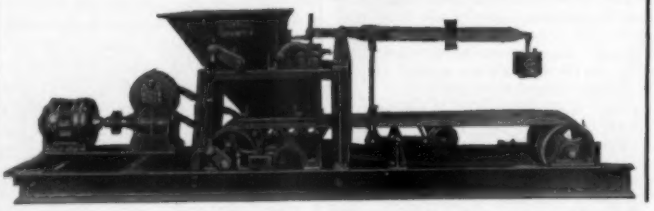

Write for Catalog No. 5

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Poidometers handle all these vital jobs automatically, and are so well-designed and constructed that they insure long-term, continuous service, high product uniformity, and maximum output.

These versatile units are now available with remote controls for showing and changing feed rate and with total weight recorders.

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1 origins to New York and Brooklyn, N. Y., $6.38 per net ton, subject to Ex-Parte 175 increase. Rate named will also apply on limestone, ground or pulverized, when containing not in excess of 3 percent of other minerals either physically or otherwise added.

Bulletin G-6153 (Shipper) — Dolomite, roasted (refractory dolomite in granular form, treated or untreated, clinkered and/or burned to a dead state) carload minimum weight 70,000 lb., from Chippawa and Niagara Falls, Ont., to St. Louis, Mo., 67 cents per 100 lb., subject to ExParte 175 increase.

ILLINOIS FREIGHT ASSOCIATION

Docket IRC 511-1144—Crushed stone and articles taking same rates from Joliet, Ill., to Kankakee, Ill., minimum weight 90 percent of marked capacity of car. Proposed to establish rate of $1.23 per net ton in open or closed cars, applicable on intrastate traffic, subject to ExParte 175-A.

Docket IRC 511-1148—Proposed to establish a rate of 113 cents per net ton, open-top cars and 117 cents per net ton in closed cars on crushed stone, strippings, or stone dust, carload, from Thornton, Ill., to Craigs, Ill., minimum weight 90 percent of marked capacity of car except that when car is loaded to full cubical or visible capacity, actual weight will apply.

Docket IRG 511-1167—Proposed to establish on crushed stone, carload minimum weight 90 percent of marked capacity of car, except that when cars are loaded to full visible capacity, actual weight will apply, but not less than 20 tons, from East St. Louis (Falling Springs), Ill., to Fairfield, Ill., and intermediate points.

	Rates in cents per ton (2000 lb.)	
	Present	Proposed
Fairfield, Boyleston, Sims, Wayne City and Keenes, Ill.	144	138

Rates subject to ExParte 175 increase.

MONTANA LINES COMMITTEE

Docket (X) A-559 (S)—Proposed to establish on sand, gravel, and crushed stone (broken, crushed or ground), carload, from Billings, Mont., to Vocation and Cody, Wyo., 211 cents per net ton, subject to X-175 inclusive, minimum weight marked capacity of car except that when loaded to capacity, actual weight, but not less than 60,000 lb., will apply.

PACIFIC SOUTHCOAST FREIGHT BUREAU

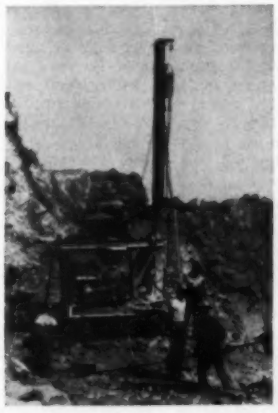
Docket 2806 (S)—Request for rate of 75 cents per ton, minimum 50 tons, on stone, natural, rough quarried (other than granite, marble, jasper or onyx), carload, from Drake and Ash Fork, Ariz., to Idaho Falls, Twin Falls, St. Anthony, and Ketchum, Idaho.

Docket 2807 (S)—Proposed to establish on stone, broken (in open cars), from Cantil to Los Nietos, Calif., rate of 11 cents, minimum 50 tons.

Docket 2815 (S)—Request rate of 24 cents, minimum 50 tons, on rock, perlite, described in item 1808 Pacific Southcoast Freight Bureau tariff 278, carload, from Lovelock, Nev., to Fresno, Calif.

NORTH PACIFIC COAST FREIGHT BUREAU

Docket NC-1949 (Supplement 5)—Pro-



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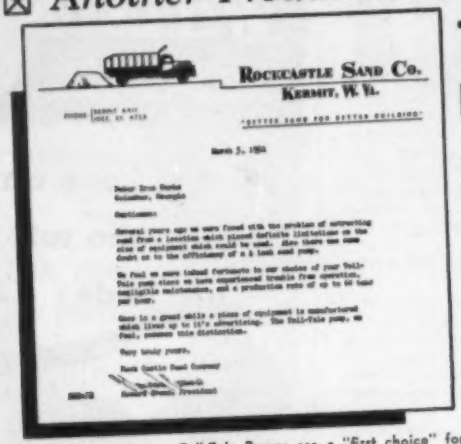
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By [illegible] Owner

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1019

posed to establish on limestone, crushed, ground or powdered, in open or closed cars, carload, rate of 17 cents per hundredweight in open cars and 19 cents per hundredweight in closed cars, minimum 50 tons. Cooper, Wash., to Fall City, Moalla, Peedee, and Willamina, Oreg.

Docket X NC-2654—Proposed to establish on silica rock, in open cars, carload, from Rockport, Wash., 7½ cents, to Seattle, Wash., 10½ cents per hundredweight to Tacoma, Wash.; 13 cents hundredweight to Portland, Oreg., Vancouver, and Rock Island, Wash., minimum 50 tons.

Docket NC-2664—Request rate of 6 cents hundredweight on sand and gravel, carload, from Spokane, Wash., to Moscow, Idaho; 5½ cents hundredweight to Colfax and Pullman, Wash., minimum 50 tons, and related rates to LaCrosse and Downs, Wash., and to include absorption of switching.

WEEKLY DOCKET AND STATUS REPORT OF PRIOR SOUTHERN FREIGHT ASSOCIATION PROPOSALS

Docket A 10776 (A)—Revise rates on lime, carload, 50,000 lb., from southern points (other than Virginia groups) to Florida peninsula points, to reflect basis of 80 percent of basic lime rates, subject minimum weight 30,000 lb., and then increased to reflect proper ExParte 162-6-8 increases.

SOUTHWESTERN FREIGHT BUREAU

Docket 60568 (S)—Stone, crushed, from Little Rock, Ark., to Marrero, La., publish rate on crushed stone (not roofing granules) ranging in size up to 200 lb. in weight of $3.00 per net ton (not subject to X-162-166 or 168), minimum weight 40 tons.

Docket 60574 (S) — Silica sand, from Guion, Ark., to New Orleans, La. Proposed to establish rate of 443 cents per net ton, not subject to X-162, 166, or 168, in closed cars or in covered hopper cars.

FREIGHT TRAFFIC COMMITTEE
Trunk Line Territories Railroads

Docket TL M-2110 (Carrier)—Proposed to issue rate of 80 cents per net ton, subject to ExParte 175 increase on sand and gravel, carload, in open-top cars, minimum weight 90 percent of marked capacity of car from Cuddebackville, N. Y., to Fallsburg, N. Y. This is issued to meet motor competition.

Docket TL-M-2106 (Shipper) — Proposed to establish on limestone, crude, fluxing, foundry or furnace, only when loaded in bulk in open-top equipment, carload, during period of car shortage when open-top equipment is not available and closed equipment is furnished, rates applicable when using open-top equipment will apply, minimum weight except as otherwise provided to be 90 percent of marked capacity of car from Capon Road and Strasburg Junction, Va., and Engle, W. Va., to Fairless, Pa., $2.78 per gross ton, subject to ExParte 175 increase.

Docket TL M-2133 (Carrier) — Stone, natural (other than bituminous asphalt rock), crushed, in open-top cars not protected by tarpaulin or other protective coverings, carload minimum weight as per item 5 of N.Y.C. Railroad tariff ICC 342 from Prospect Junction, N. Y., to Herkimer, N. Y., 89½ cents per net ton, sub-

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ject to ExParte 175 increase, to be issued to meet motor truck competition.

Dockets TL M-2150 (Shipper)—Limestone, crude, fluxing, foundry or furnace, when loaded in open-top equipment, carload minimum weight 90 percent of marked capacity of car from Martinsburg and Engle, W. Va., and Oranda, Va., to Lynchburg, Va., $2.43 per gross ton, subject to ExParte 175 increase. Note: During period of car shortage when open-top equipment is not available, and closed equipment is furnished, rates applicable when using open-top equipment will apply.

Docket TL M-2160 (Shipper)—Proposed to establish on slag, crushed (the product of iron and steel furnaces), in bulk, in open-top equipment, carload minimum weight 90 percent of marked capacity of car from Johnstown, Pa., to Kane, Pa., $2.31 per net ton, subject to ExParte 175 increase.

WESTERN TRUNK LINE COMMITTEE

Docket E-41-1591 (C)—Proposed to establish on limestone, crushed, ground or pulverized, when any other material or materials, not in excess of 3 percent have been added physically or otherwise to the actual weight of the natural limestone, from Alden, Iowa, to Ft. Dodge, Iowa, 79 cents; and Webster City, Iowa, 58 cents per net ton.

Docket E-41-1584 (S)—Proposed to establish on stone, broken, crushed, or ground, in open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply, from Hannibal and Huntington, Mo., to Wabash stations in Illinois and St. Louis, Mo. Representative points shown below:

To	Proposed Rates Cents per Net Ton
Champaign, Ill.	185
East Decatur, Gibson City, Monticello, Taylorville and Litchfield, Ill., and St. Louis, Mo.	169
To	**From Huntington, Mo. (Only)**
Decatur and Illiopolis, Ill.	139

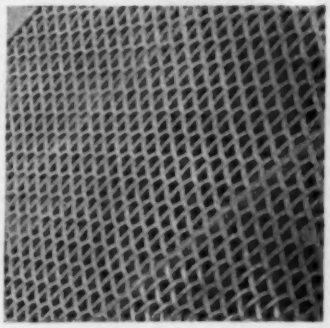
Above rates include ExParte 162, 166, and 168 increases and will be subject to ExParte 175-B.

Docket X-E-41-1596—Proposed to establish a rate of 74 cents per ton, subject to X-175, on sand and gravel, minimum weight 90 percent of marked capacity of car except that when actual weight of shipment loaded to full visible capacity of car is less than 90 percent of the marked capacity of car, actual weight will apply, but in no case shall the minimum weight be less than 20 tons, from Prairie du Chien, Wis., to Boscobel, Wis. Subject to expiration date of one year from effective date.

Dockets X-E-41-1604—Proposed to establish on stone, crushed, minimum weight 90 percent of marked capacity of car, from Spence, Kans., to Jeffers, Glenvil and Level, Nebr., $1.23 per net ton, subject to X-175-B.

Docket X-E-41-1605—Proposed to establish on sand, carload, in open equipment from Dousman, Wis., to South Milwaukee, Wis., 72 cents per net ton, subject to ExParte 175-A increase. To apply on intrastate traffic only and only as a terminal rate.

HEWITT



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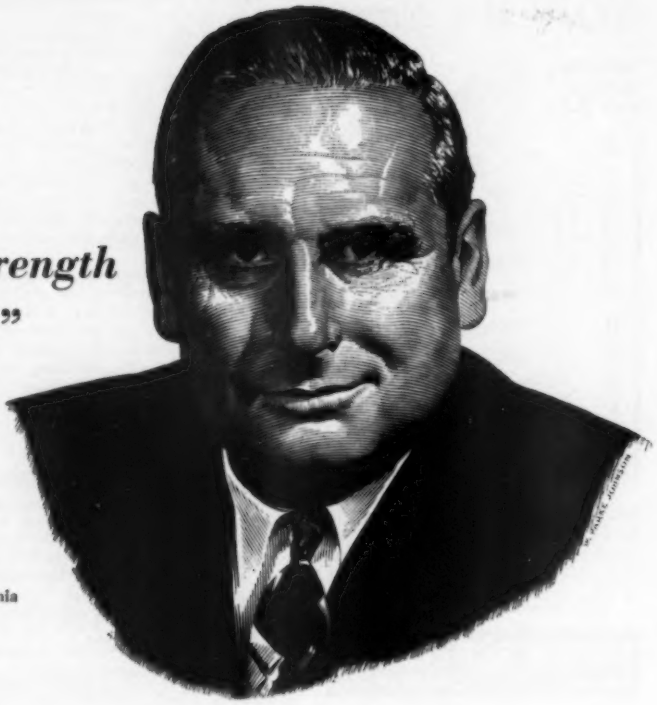

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President, Union Oil Company of California

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- monthly redemptions of unmatured E Bonds during each of 9 months (April to December, 1951) were less than 1% of the amounts outstanding.
- the *cash value* of Series E Bonds held by individuals on December 31, 1951, amounted to $34,727,000,000—$4.8 billions more than the cash value of Series E's outstanding in August, 1945.

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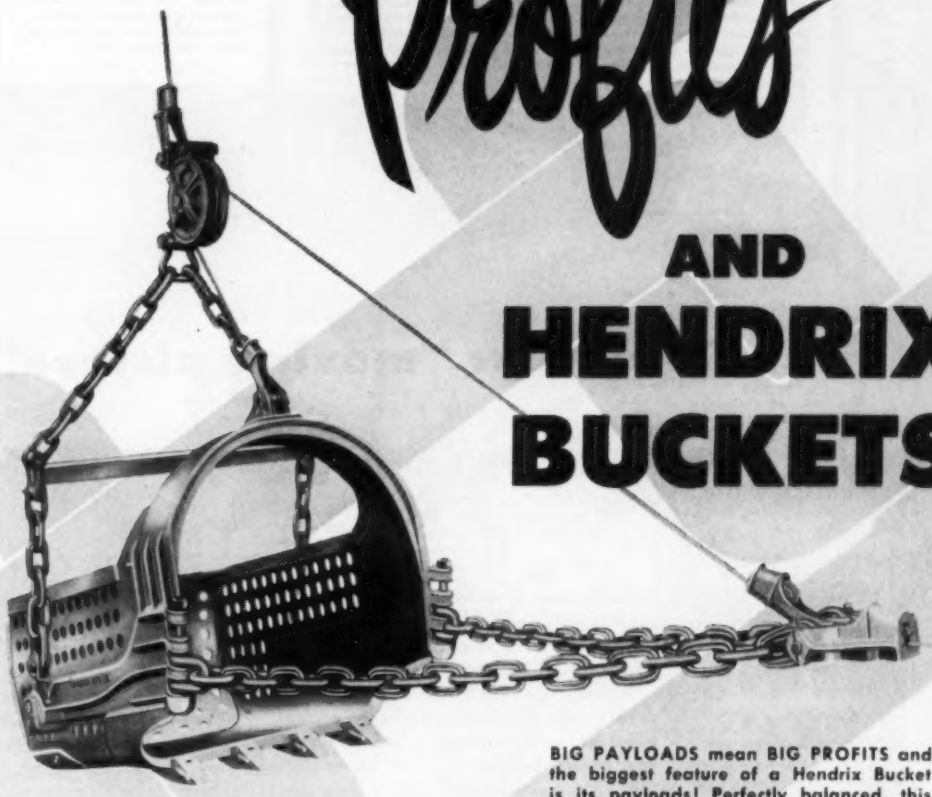

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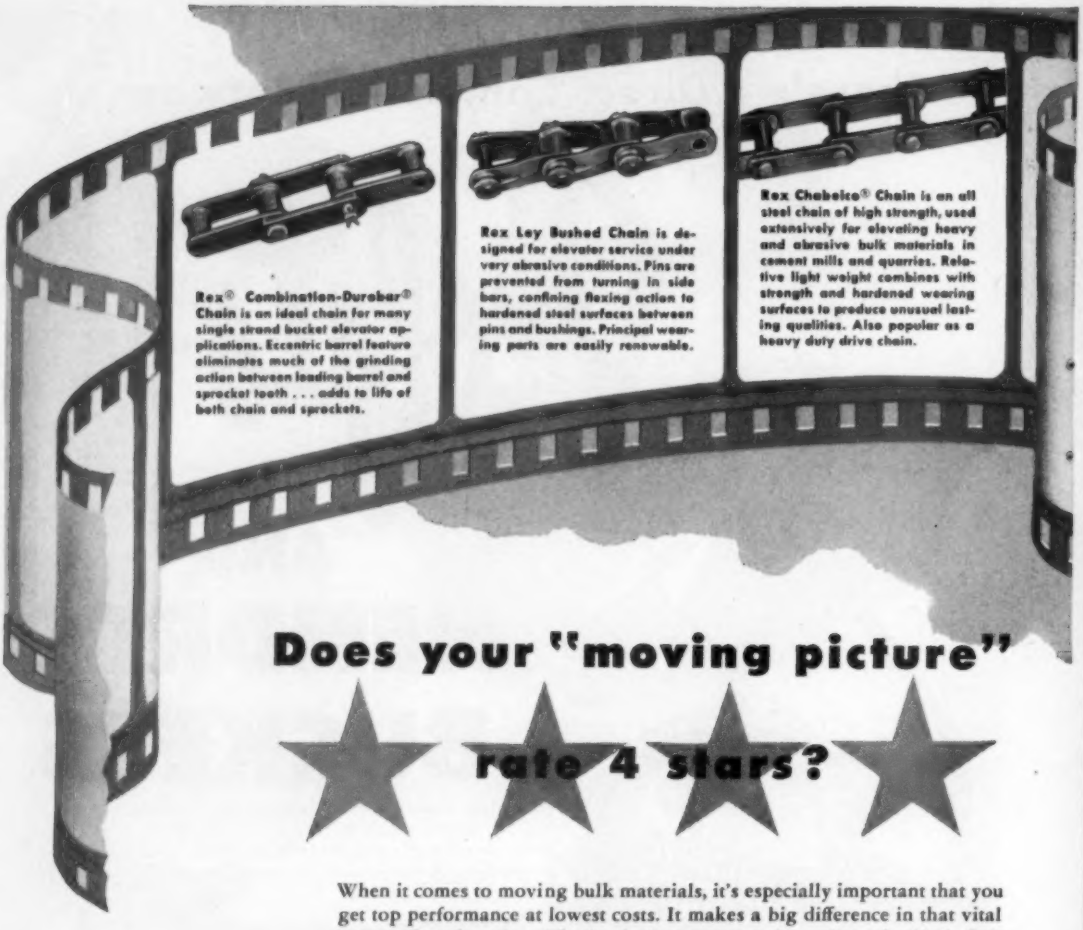
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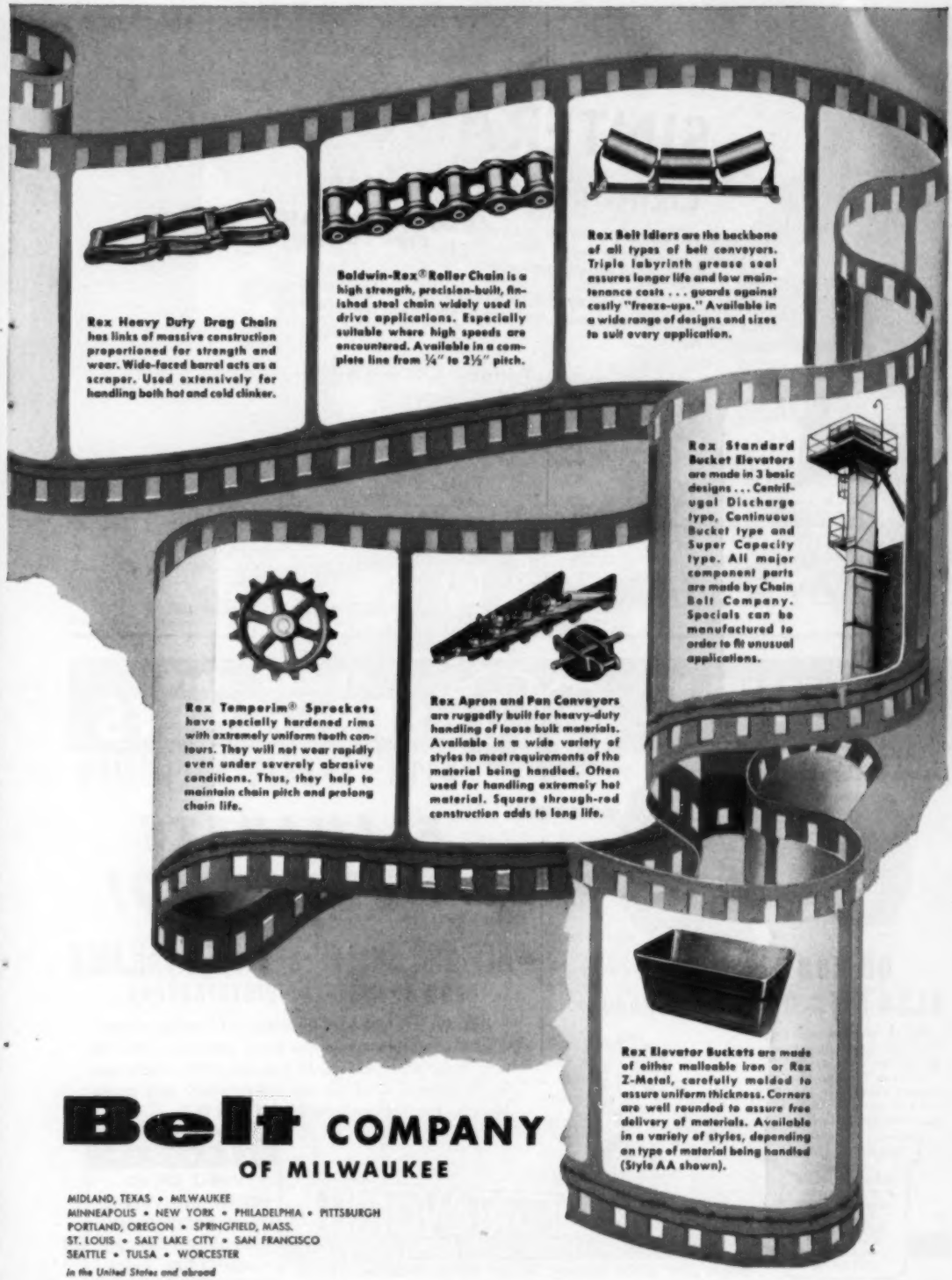

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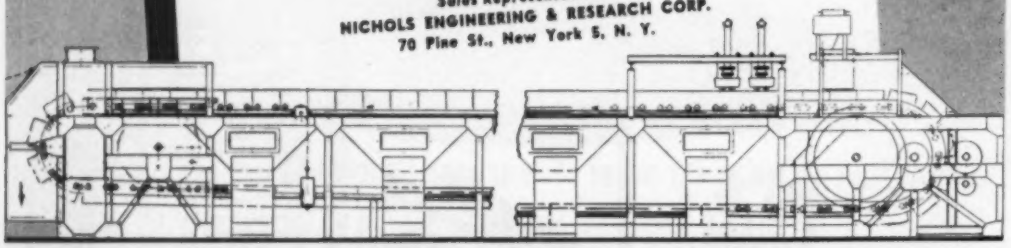
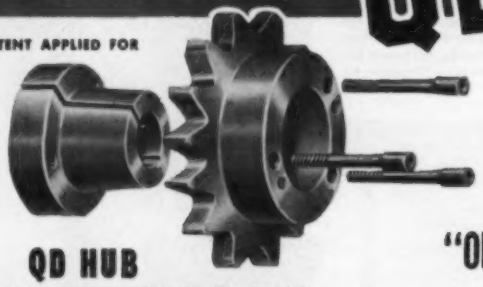


FORT WORTH QD ROLLER CHAIN SPROCKETS

WITH TAPERED SPLIT HUB

PATENT APPLIED FOR

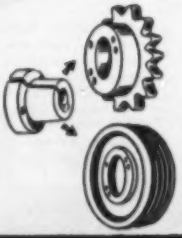


ELIMINATE REBORING!

QD HUB ALSO FITS QD V-Belt Sheave

Speed changes are simplified and "spare" sprockets can be carried more easily.

If your favorite distributor doesn't stock this new item, tell him about it. He'll reward you with better service.



"OFF THE SHELF" SERVICE AVAILABLE FROM INDUSTRIAL DISTRIBUTORS

Reboring of stock bore sprockets to fit various shafts is eliminated due to the various bores available in the QD hub. Installation and removal from the shaft is made easy by the tapered fit of the hub and sprocket. Hub assembly grips the shaft equivalent to a "press fit."

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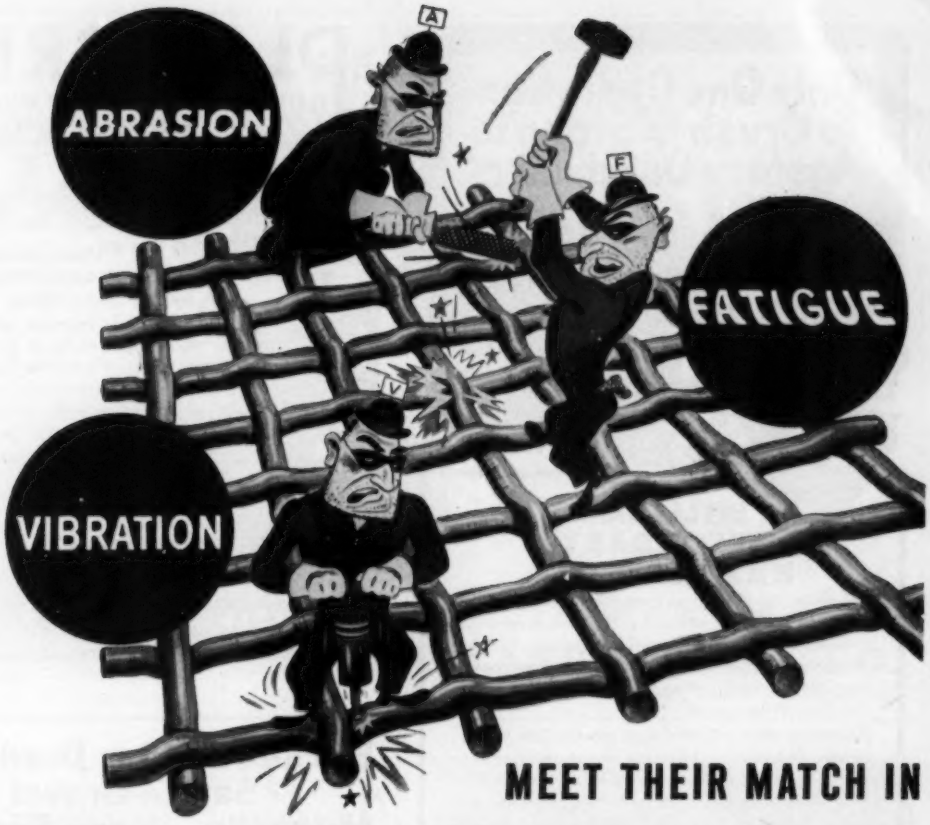

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Super-Tempered Precision Space Screens

Here's a troublesome threesome that spells early wear and untimely end for ordinary screens. Costs you plenty, too, in disrupted production and more frequent screen replacement.

It's a different story when you put Super-Tempered Precision Space Screens against these destructive forces. Long-wearing Super-Tempered Screens give you the advantage of extra durability that means less downtime . . . longer, more accurate service . . . greater tonnage output at lower cost. And here's why:

First: Super-Tempered Precision Space Screens stay tight and maintain accurate uniform spacing because they're crimped and woven extra tightly on powerful hydraulic looms of exclusive design.

Second: They give long-lasting resistance to abrasion and fatigue because they're made of special super-tempered steel rolled and heat-treated in our own plants to assure the correct degree of hardness and ductility.

For additional information, contact our nearest office or consult your classified telephone directory.

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PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
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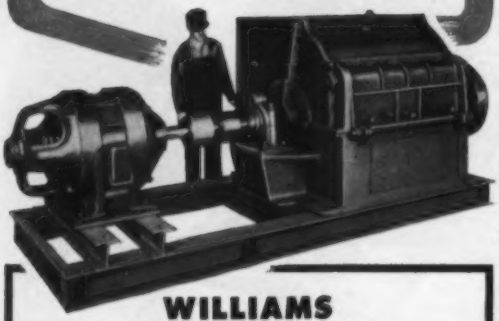
Only One Operation To Crush 6" Stone To Agstone Or Smaller!



WILLIAMS SECONDARY HAMMER MILLS

For speed and stepped-up output in reducing rock of 6" size to agstone — or down to 20 mesh if required — Williams secondary hammer mills are in a class by themselves! Capacities range up to 75 tons per hour. Hundreds of installations have proved them outstanding profit-makers!

Extremely heavy rib-reinforced construction — manganese steel liners and breaker plates — easy adjustment to compensate for wear — double duty hammers — metal trap for tramp iron — instant access for service — these and many other features make the low cost Williams Hammer Mills top paying investments!

Many Sizes For Any Requirement

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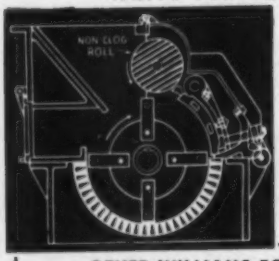

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The best way to handle wet, sticky clay or shale direct from pit for quick grinding without clogging. Roll is attached to hopper opening. Can be driven off main pulverizer shaft if desired.

OTHER WILLIAMS EQUIPMENT

ROLLER AND IMPACT MILLS with Air Separation for grinding to 325 mesh or finer . . . HELIX-SEAL MILLS for dustless or wet grinding . . . DRYER MILLS . . . AIR SEPARATORS . . . VIBRATING SCREENS . . . COMPLETE "PACKAGED" PLANTS ready to install.

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OLDEST AND LARGEST MANUFACTURER OF HAMMER MILLS IN THE WORLD

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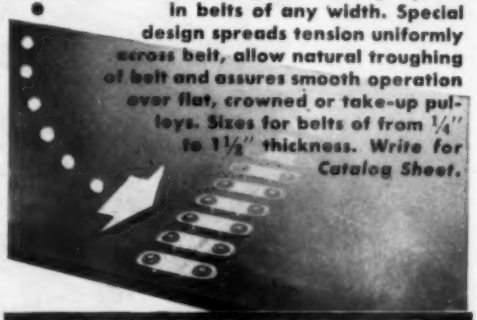
PLATE FASTENERS FOR CONVEYOR BELTS

Make strong dust-tight, water-tight joints in belts of any width. Special design spreads tension uniformly across belt, allow natural troughing of belt and assures smooth operation over flat, crowned or take-up pulleys. Sizes for belts of from 1/4" to 1 1/2" thickness. *Write for Catalog Sheet.*



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Screen Plates — Bucket Pins

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Exploration for coal and other mineral deposits. Foundation test boring and grout hole drilling for bridges, dams and all heavy structures.

Core Drill Contractors for more than 60 years

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MICHIGAN CITY, INDIANA

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Eliminating excessive costs could mean eliminating old, obsolete equipment. When replacing your worn, out-of-date hauling equipment, be sure you put LANDIS in your fleet! LANDIS' smooth-surface welded bed construction means no more "free rides" for load-hangers!

Now, the LANDIS hydraulic lifts dump the entire load in one smooth operation . . . eliminating load-hanging.

16.4 cu. yd. hydraulic semi-trailer as used by Columbia Quarry Company.

Smooth bed surface with no nuts, bolts, heads, etc., permits quick, easy discharge of complete load. Available with end, side or bottom dump, plus safe, positive connection with sure, instant response.

DESIGNERS OF SPECIALIZED HAULING EQUIPMENT

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Box 248 Picher, Okla. Phone 734

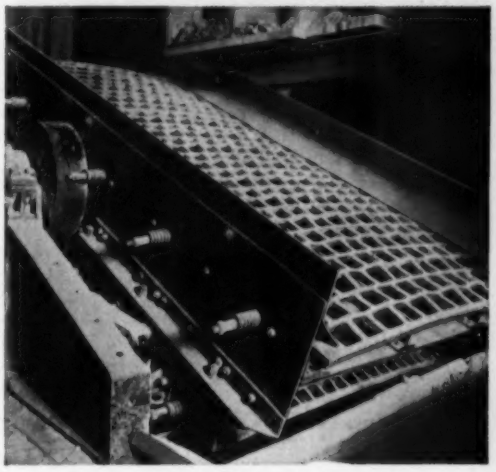
Assure product uniformity

with Hendrick Perforated Plate

Material is always properly sized when Hendrick Perforated Plate is used on vibrating and shaking screens, because the mesh remains uniform throughout an unusually long service life.

For screening highly abrasive materials Hendrick Perforated Plate is heat-treated to increase its toughness.

For full information regarding the hundreds of combinations of shapes and sizes of perforations, and the kinds of steel and other metals in which Hendrick Perforated Plate is furnished, write for a copy of the Hendrick Perforated Plate Catalogue.



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FOR SALE: Operating Perlite Business

One tenth the weight of sand and a splendid insulator.

The famous *AleXitE* Mine, Plant and Business is *for sale at a bargain,* because of the declining health of its owner-operators, and expansion of the movie and television advertising business of its parent company, the Alexander Film Co.

The mine and plant are in full scale operation, turning out that extra tough *PerAleX* ore and aggregate, said to be the best in the industry. Demand is increasing.

Mill is located at Florence, Colorado on two railways, with favorable freight rates to 90% of the U.S.A. population. It is equipped with complete facilities for sizing furnace-ready ore and an expansion furnace. . . . Large quantity of blocked out ore at mine.

Physical assets appraised at approximately $600,000 and entire properties *can be purchased for $300,000,* including research data developed over several years, additional mine surveys and business on hand with current customers.

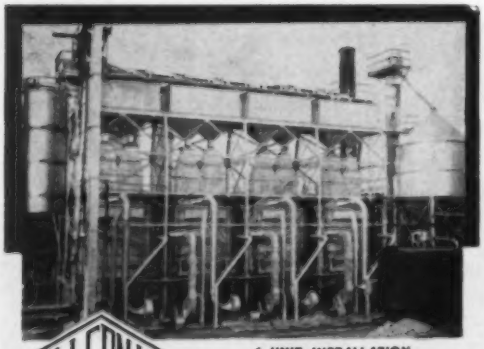
The entire operation is open to inspection by those interested and further data may be obtained from:

J. Don Alexander, Pres.

ALEXANDER FILM CO.

Alexander Film Bldg.

COLORADO SPRINGS, COLO.



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For Burning LIMESTONE, DOLOMITE, etc.

2 SIZES AVAILABLE

PREHEATS - CALCINES - COOLS

AUTOMATIC CONTINUOUS OPERATION

MINIMUM FUEL CONSUMPTION

There are extra dividends available in the operation of your plant when you use Ellernan Calciners . . . let us explain the exclusive features . . . write today for literature and detailed information applicable to your operation.

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BELT FASTENERS and RIP PLATES

FOR HEAVY CONVEYOR AND ELEVATOR BELTS OF ANY WIDTH

★ FLEXCO Fasteners make tight butt joints of great strength and durability.

★ Trough naturally, operate smoothly through take-up pulleys.

★ Distribute pull or tension uniformly.

★ Made of Steel, Monel, Stainless, Everdur. Also Promal top plates.

Compression Grip distributes strain over whole plate area

★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.

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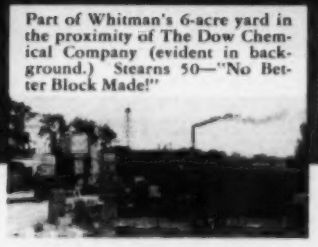
THE CONCRETE MANUFACTURER

A SPECIAL SECTION OF PIT AND QUARRY

The Growth of an American Community— MIDLAND, MICHIGAN



Part of Whitman's 6-acre yard in the proximity of The Dow Chemical Company (evident in background.) Stearns 50—"No Better Block Made!"

The Whitman Company is furnishing concrete block made with the Stearns 50 to Faulkener Construction Company for these two enormous buildings at Midland's Dow-Corning Corporation. The Austin Company is another of their big Stearns Block customers for Dow Chemical Company expansion.

The Midland County Garage on the outskirts of the city is another huge Stearns 50 Concrete Block structure (100' x 315'—original order 84,000 units.) Whitman also furnishes Stearns Block for the Chemical City's many, beautiful, modern and modernistic homes, schools, churches, office buildings, etc.

Stearns Manufacturing Company is particularly proud to be playing a big part in Midland's recent enormous expansion. The *sturdy, compact, concrete masonry units* used in the construction of the Chemical City's up-to-date factory buildings, homes and other structures are manufactured by the local supplier, John A. Whitman & Son, with the New, One-Man, Automatic, Vibratory, *STEARNS 50 Concrete Block Machine.*

"NO BETTER BLOCK MADE!"...
says James Dean, owner of the Whitman Company, as verified by nationally-known builders who use his units.

OWN IT!—The Key to SUCCESS for AMERICANS—ON THEIR OWN!

STEARNS
MANUFACTURING COMPANY - INC
ADRIAN • MICHIGAN

STEARNS M... STEARNS 50 ... SINTERLITE BOLTCREYES MIXERS SKIP LOADERS TURNTABLES SINTERLITE

Feeds easily through machine

Product manufacturers find Duraplastic air-entraining portland cement permits use of a damper mix. This results in a more cohesive, "rubbery" mix that holds together better and feeds easily through machines. Duraplastic has proved its superiority for concrete block, brick, pipe, drain tile, silo staves and other products.

Makes superior concrete products

Plants using Duraplastic report reductions in costly breakage of green products. There are fewer culls and throwbacks. Edges and corners are clean-cut and truer. Face texture is generally improved and finished units exhibit greater resistance to passage and absorption of water.

YET DURAPLASTIC* COSTS NO MORE

It sells at the same price as regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

OFFICES: *Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.*

"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

ATLAS®

DURAPLASTIC

AIR-ENTRAINING PORTLAND CEMENT

Makes Superior Concrete Products at No Extra Cost

PQ-D-122R

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—September to June*

The CONCRETE MANUFACTURER August 1952

Glamorize The Block

WHEN the Concrete Products Association of Detroit met some weeks ago at Alpena, Mich., for a regular business session, the announced theme of the program was *Concrete Masonry Above Grade*. It will certainly not surprise those of our readers who have taken part in similar discussions to learn that the 8- by 8- by 16-in. unit came in for some pointed criticism. Judging from the steady lambasting it receives year after year, the 8-in. high masonry unit on esthetic grounds enjoys almost as little esteem within the block industry as it does among architects, builders, and the general public.

If this is a valid observation, one may well ask how the industry has managed to grow and prosper as it has, and why, in the face of such unanimity of opinion, it has failed to develop and adopt a standard unit of such proportions as might achieve some sort of universal esthetic appeal. One obvious answer to the first question is that nobody knows how much *more* the industry might have grown and prospered if its product had been stronger in the glamour department. There is certainly reason to believe that the 8-in. high unit has been a serious handicap in the private residential building field, where the industry is still notably and surprisingly weak. We say "surprisingly" because from every other possible point of view concrete masonry offers the individual home builder the best value for his money.

Economic considerations have been largely responsible for the block industry's failure to adopt a unit which would appeal to the general public. Half-high units have achieved considerable success wherever they have been marketed intelligently, but the industry as a whole appears to find this solution unacceptable on the grounds that it sacrifices cost advantages in both the manufacture and end use of the product. This was a fairly valid argument during the era when economy was about the only virtue which the industry could substantiate for its product, but the whole point of view is now about as dated as is the rock face unit, once regarded as a pretty daring attempt to woo the public.

We can see no vestige of sense in continuing to ignore public preference by offering the 8-in. high unit for exposed work in residences. Certainly the economic factor no longer provides any conclusive argument, now that masons are in a position to insist upon stringent unit weight limitations. Those producers who have successfully marketed the half-high unit claim that increased in-the-wall cost is actually negligible, as compared with the tremendous selling advantage which the smaller unit provides.

No one will argue seriously that the 8-in. high unit has outlived its usefulness. In many applications its esthetic properties are entirely satisfactory, and it has literally scores of major uses in which appearance is not a factor. By all means let the present standard unit continue to serve the markets for which it is so well adapted, but offer the home builder a companion product which will rate at least as high in beauty as the basic material does in all other attributes. There is a major market at stake, and the block industry can ill afford to let habit, stubbornness, or simple inertia stand in its way.

William M. Avery

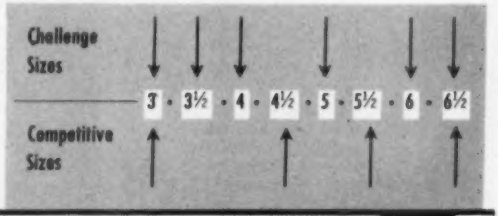
Only with CHALLENGE *can you*

match the mixer to the truck

The Versatile Challenge Mixer Line Lets You Choose
The *Right Size Mixer* For Your Individual Truck . . .

Why, therefore, settle for a 3 yard mixer when your truck will easily handle a Challenge 3½ Yard Mixer; or why, for example, mount a 4½ Yard Mixer on your truck when it is perfectly capable of carrying a Challenge 5 Yard Mixer?

Only with Challenge do you have such a wide range of choice covering all standard, factory-built trucks. Take full advantage of both the physical and legal capacity of your truck and mixer. Your Cook Bros. Challenge Mixer dealer can give you all the details . . write, wire or telephone TODAY!



Challenge 6 Yard Mixer mounted on Ford F-8 Truck chassis with tandem drive, operated by Modern Builders Supply Inc., of Sarasota, Florida. This Challenge Mixer and Ford Truck Unit have a physical payload capacity of 6 cu. yds. of concrete.

Vern Wheeler Equipment Company, Inc., Jacksonville, Florida is the Cook Bros. dealer in this area.

Cook Bros. Equipment Co.

Please forward the name and address of my nearest Challenge dealer who can advise me of the right size Challenge Mixer for my trucks.

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news of the concrete industries

Death of Edwin H. Fox, Leader in A.C.P.A., Loss to Pipe Industry

Edwin H. Fox, director of the American Concrete Pipe Association, and also a past president of the Association, died on July 13 in Cincinnati, Ohio.

Mr. Fox, a native of Toledo, Ohio, spent most of his life in that city, going to Cincinnati 17 years ago to be secretary-treasurer and general manager of the Cincinnati Concrete Pipe Company.

Edwin H. Fox

Known as one of the most active members in the American Concrete Pipe Association, Mr. Fox served as its president during 1950 and 1951, and was at the time of his death a member of the board of directors. He was also president of Concrete Pipe Association, Inc., from 1950 to 1952. His affiliations with technical organizations included the Ohio and the National Society of Professional Engineers.

Wage Stabilization Board Okays Group Insurance Plan

Approval of the National Ready Mixed Concrete Association's Group Insurance Plan was granted recently by the Wage Stabilization Board. This means that the plan can become effective as soon as members of the Association totalling at least 600 covered employees become participants in the plan.

It is urged by Association officers that prospective participants take the following steps in order to join the plan: mail in signed application and subscription blanks with a check to cover the initial premium; sign and return letters of authorization to N.R.M.C.A. headquarters. Since the plan cannot become effective until the required 600 employee participants have signed up, those interested are advised to act promply. Informative booklets and all necessary forms will be sent to members upon request.

Cinder Concrete Industry To Hold Summer Meeting

On August 11, 12, and 13, the summer meeting of the Cinder Concrete Manufacturers will be held at the Chalfonte-Haddon Hall, Atlantic City. Sessions have been scheduled for mornings, with group luncheons at noon. Afternoons will be free for ocean bathing.

All sessions will be in the form of round-table discussions, according to the practice found so profitable in earlier meetings.

Al Turner has purchased the Modern Cement Products Company of Fallbrook, Calif., formerly owned by Royce E. Gibbs. Mr. Turner plans to add several products to the firm's present line of concrete blocks, draintile, septic tanks, and sand and gravel. The new products include red brick, flue linings heat forms, fire brick, and related items.

Events Coming

August 11-13, 1952—Atlantic City. Summer meeting, Cinder Concrete Manufacturers. Chalfonte-Haddon Hall.

February 23-26, 1953—San Francisco. 23rd annual convention, National Ready Mixed Concrete Association. Hotel Fairmont.

N.R.M.C.A. to Co-operate With Truck Mixer Makers In Comprehensive Tests

What is believed to be the most comprehensive investigation of truck mixers ever made will be carried out this summer by the National Ready Mixed Concrete Association in co-operation with the Truck Mixer Manufacturers Bureau. The tests will be conducted by the Association's staff at its Research Laboratory in the College of Engineering of the University of Maryland.

The uniformity of concrete mixed at different rates and for different times in full-size truck mixers will be studied by means of tests for strength, consistency, and proportions of ingredients. Samples will be taken throughout the discharge of the batch. Studies of the effect of volume of batch, from considerably below rated capacity to considerably above, also will be made. The work will be carried out over a period of about two months and is planned to involve tests of approximately 100 batches of concrete from standard truck mixers.

To facilitate control, a small aggregate batching plant is being erected on the premises of the A. H. Smith Sand and Gravel Company at Branchville, Md., about 2½ miles from the university. Separate stockpiles of aggregate, with the course aggregate in two sizes, are being provided. Careful attention will be given to reduction in segregation during the stockpiling. Bulk cement will be drawn from a bin belonging to the A. H. Smith Company, and the same brand of cement will be maintained throughout.

As tentatively outlined, the investigation falls in three groups. The first group will comprise tests with a single horizontal axis truck mixer, involving a detailed study of the principal variables —volume of batch, mixing rate, and mixing time.

In the second group similar tests will be made, but in somewhat less detail, with two types of high-discharge mixers. In the third group several different mixers provided by the manufacturer will be tested in the light of experiences gained in the first two groups. A unique feature of this phase of the investigation is that test results for individual mixers will be kept confidential even from the manufacturer himself. Results will be published so as not to reveal the make.

Pipe, Ready-Mix and Block Industries Represented In New Plant Installations

Concrete pipe ranging from 4 to 16 in. in inside diameter will be produced at a new 9000-sq.-ft. plant being constructed at Jackson, Tenn., by the Kendrick Concrete Pipe Co. The plant will have a capacity of 75 tons a day and about 15 persons will be employed.

The J. F. Edwards Company, a new concern in the ready mixed concrete field, recently opened a plant at Genesco, Ill. Two 2-cu.-yd. truck mixers will be operated initally. The plant will be operated by Dave B. Edwards.

One of the newest industries at Osborne, Wash., is the recently completed manufacturing plant of the United Concrete Pipe Company. Construction began early this year, and the first units were produced on a limited scale some weeks ago. It is expected that the plant will employ 40 to 50 men when full production is reached. The plant is the fifth to be constructed by the United Concrete Pipe Co. and the second to be located in the state of Washington.

Richmond Concrete Products Company recently completed construction of a plant at Augusta, Ga., and began the manufacturing of concrete masonry units. Albert Von K. Gary is president of the new concern. It is expected that between 35 and 40 persons will be employed.

Products Men in Limelight Of Civic, Industry Affairs

Lawrence A. Bogert, president of the L. A. Bogert Concrete Products Company, St. Cloud, Minn., was recently elected mayor of that city.

W. A. Nelch, head of Nelch Concrete Products Co., Danville, Ill., was named chairman of a newly-organized national affairs committee during a meeting of the Danville Chamber of Commerce.

Keith Nelch, an official of Henry Nelch and Sons Company, producers of ready-mixed concrete at Springfield, Ill., was recently elected president of that city's Junior Chamber of Commerce.

Norman J Fredericks, an official of tre Koenig Coal and Supply Company, Detroit, Mich, and immediate past president of the National Ready Mixed Concrete Association, recently became president of the Michigan Ready Mixed Concrete Association.

Western Producers Hosts To Visiting N.C.M.A. Members

After the mid-year board meeting of the National Concrete Masonry Association in San Francisco late in June the following group of members and wives visited in Seattle on July 1: Mr. and Mrs. H. W. Bush, East Orange, N. J., Mr. and Mrs. W. J. Manhardt, Milwaukee, Wis., Mr. and Mrs. E. H. Brooke, Washington, D. C., Mr. and Mrs. F. W. Reinhold, Buffalo, N. Y., Mr. and Mrs. P. M. Woodworth, Chicago, Ill., Mr. and Mrs. E. W. Dienhart, Chicago, Ill., Glen C. Barnes, Syracuse, N. Y., Mrs. Evelyn Bouet, Chicago, Ill., E. A. Peterson, Ventura, Calif., Harvey Kilmar, Des Moines, Iowa, and Mr. and Mrs. Lewis Lloyd, New Orleans, La.

Hosts to the visitors were the Associated Sand & Gravel Company of Everett, Wash., and the Graystone Concrete Products Company, Layrite Concrete Products Company and Concrete Products Association of Seattle. In the limited time available, private car tours were made to points of scenic interest.

T. H. Merriam Is Victim Of Fatal Heart Seizure

Theodore H. Merriam, a partner in Central Gocorp, sales agency of the Gene Olsen Corporation, Adrian, Mich., died recently of a heart attack. He was 53 years old. Mr. and Mrs. Merriam had returned earlier in the day from Cambridge, Mass., where they attended the commencement exercises of their daughter at Radcliffe College.

Mr. Merriam, a graduate of the University of Illinois, was associated with the Portland Cement Association before

going to Adrian in 1944 to join the sales department of the Stearns Manufacturing Company. In 1947 he became that firm's eastern representative.

Subsequently he and C. S. Delamater became partners in Central Gocorp, a concrete block machinery sales agency for the Gene Olsen Corporation.

A wage increase of nine cents per hour for employees of 13 ready-mixed concrete firms in the St. Louis, Mo., area was approved recently by the ninth regional Wage Stabilization Board. The new rate brought the hourly rate to $1.82½.

Richard Lee Schmidt, owner of the Capitol Concrete Products Co., Topeka, Kans., died on April 10, in a Topeka hospital. He was 41 years old.

Concrete Masonry Assn. Directors Hold Mid-Year Meeting at San Francisco

Directors of the National Concrete Masonry Association met on June 23 and 24 at San Francisco's Fairmont Hotel for their annual mid-year meeting, which proved to be an enjoyable and memorable occasion.

On June 20 the group had been guests of Al Streblow at his plant (the Basalt Rock Company) at Napa, Calif., and on the following day two committee meetings were held—the Technical Problems Committee, headed by Paul Branson, Best Block Company, Milwaukee, Wis., and the Publication and Publicity Committee, chairman, Phil Paolella, Plasticrete Corporation, Hamden, Conn.

Among the many items of business considered at the sessions which followed was a report of the Finance Committee, presented by Glenn C. Barnes, Barnes & Cone, Inc., Syracuse, N. Y., which led to a suggestion that non-members of the Association be assessed a $20 fee for the privilege of attending the annual convention.

Horace Bush, Multiplex Concrete Company, Inc., East Orange, N. J., and Ed Brooke, National Brick & Supply Company, Inc., Washington, D.C., reported on a special meeting held recently in Washington at which plans were discussed with OPS for area pricing in the concrete masonry industry. It is hoped that the proposed change will revise prices and place them on a more equitable basis.

B. A. Bledsoe Named to Staff Of Universal Concrete Pipe

Byron A. Bledsoe has been appointed an engineering representative of the Atlanta office of Universal Concrete Pipe Co., Columbus, O., according to an announcement issued by H. X. Eschenbrenner, president of Universal.

Mr. Bledsoe, a graduate of Tennessee University and the Yale University Bureau of Highway Traffic, is an associate member A.S.C.E., a member of the Georgia Engineering Society, National Research Council Conference on Highway Safety and the Institute of Traffic Engineers. Since 1949 he has served at Washington, D. C., as engineer of traffic and operations for the Highway Research Board, National Academy of Sciences.

C. Ray Wilhelm is manager of Universal's Atlanta plant, and is assisted by LeRoy Epperson and Mr. Bledsoe.

At Sayre, Okla., one of the new business enterprises is Harold's Cement Supplies, a ready-mixed concrete firm. Serving as manager will be J. C. Morton, who was previously on the staff of Harold's Cement Supplies at Elk City, Okla. Owner of both plants is Harold R. Wehrenberg.

Officials of the Kent Machine Company, Cuyahoga Falls, Ohio, have announced that the eastern territory of the company has been discontinued. All of the activities of the former territory are now being handled by the main office.

Concrete Vault Producers Hold 25th Annual Meeting

HOW to sell concrete burial vaults was the keynote of the 25th annual meeting of the National Concrete Burial Vault Association, held at the Hotel St. Paul, in St. Paul, Minn., June 16-18.

President Wesley Chandler, in his message to the members, urged wider use of the testing service which had been adopted by the Association last year. A compression testing machine had been purchased by the group to test sample concrete cylinders sent in by the various vault manufacturers in an effort to maintain quality concrete in their vaults.

As burial vaults are sold only through the funeral director, a debate was presented on the topic *Why Vaults Should Not be Sold*. John L. Werness, a prominent funeral director in the Twin Cities, took the affirmative and presented several arguments, which were promptly refuted by vault men Paul Keating, "Doc" Hollingsworth, and Page Hereford. After some heated moments, it was found that Mr. Werness had been "planted" and actually was very much in favor of concrete vaults. The discussion, however, brought out many sound sales arguments.

At the luncheon meeting Newell C. Paige of Brown and Bigelow Company, discussed *Sales As They Affect The Vaultman*. He stated that there are three basic advertising needs: to build name identity among funeral directors through the use of job signs, truck signs, pencils, matches, playing cards, etc.; to hold good customers by giving the service that funeral directors want and expect and letting them know you appreciate their business; to invite more business from old and inactive accounts, and to canvas the market for new accounts.

Harold Whiteside, acting as moderator, next led a panel discussion on various factors affecting sales. Contacts with the funeral directors, cemetery personnel, bereaved families, and the clergy were discussed by various speakers to bring about more friendly and understanding relationships with these groups. These contacts, properly conducted, should result in increased sales of concrete burial vaults.

The topic, *The Proper Mix Means Dollars in Your Pocket* was discussed by S. H. Westby of the Portland Cement Association, Chicago. He stressed the importance of good quality concrete as a basic need for any concrete products manufacturer. He also urged making periodic tests on the concrete used in vaults and urged the members of N.C.B.V.A. to use the testing service that had been set up for them, or to employ commercial testing laboratories. The proper mix, he said, requires periodic testing and means dollars in the pocket of the vault manufacturer because: it will insure the most economical mix for the required strength of 4,500 p.s.i.; it will reduce breakage in handling; and will have sales value with the funeral director.

Inspections were made of two concrete burial vault plants in the Twin City area, where manufacturing operations were carefully watched.

The following officers were elected for the coming year: president, J. H. Cloud, Lexington, Ky.; vice-president, G. Page Hereford, St. Louis, Mo.; and secretary-treasurer, J. R. Van Meter, Cincinnati, O.

New directors include Elizabeth M. McCloskey, Forest Hills, N. Y., Bert G. Martin, Joliet, Ill., and Irvin E. Brouse, Ringtown, Pa.

Arrangements have been made for the convention to meet next year at Atlantic City, N. J.

• This exhibit at the 1952 Miami, Fla., Manufacturers' Exposition created much interest. A section of a block wall (background) was built to show precast concrete window frames, just as they are used in actual construction. On the table is a sectional view of a precast window frame. Producer of the frame is Everett V. Livesay.

H. W. Gabbe Named to Staff Of Universal Concrete Pipe

Universal Concrete Pipe Company officals have announced the appointment of Henry W. Gabbe as sales representative at the new Jessups, Md., plant.

Mr. Gabbe has served Maryland and Washington consulting firms as resident field engineer on many construction projects in the area. Prior to that he was an

officer of the U. S. Naval Construction Battalion. He is a member of A.S.C.E., the American Military Engineers, and the Louisiana Engineering Society.

At Jessups Mr. Gabble will handle engineering design and sales of Universal's line of manufactured concrete products.

The Jessups plant, situated 12 miles southwest of Baltimore, recently held its open house.

Ceiling Price Adjustments Okayed for Higher Freight

According to word from headquarters of the National Concrete Masonry Association, concrete masonry producers are now permitted by the Office of Price Stabilization to adjust their ceiling prices so as to reflect certain transportation costs resulting from freight rate increases which were authorized after January 26, 1951.

Permission is provided by Supplementary Regulation 106 to the General Ceiling Price Regulation and Supplementary Regulation 28 to Ceiling Price Regulation 22, effective June 24, 1952.

Up to this time the GCPR did not permit the pass-through of increased freight costs on *outbound* transportation unless the delivered price which the seller quoted was based on his plant price plus the precise amount of transportation cost to each of his purchasers. Increases in *inbound* freight costs previously could not, under any circumstances, be passed through under provisions of the GCPR.

This new action permits a producer to adjust his ceiling price for any one of the listed materials sold by him on a delivered basis so as to reflect increases in outbound transportation rates. The supplementary regulations specify that this adjustment, if made must accord with the exact amount of his outbound freight cost increase after January 26, 1951, on commodities priced under the GCPR and, since March 15, 1951, on commodities priced under CPR 22, provided that the increased transportation costs have been authorized by formal order of a federal or state government agency having such jurisdiction.

A manufacturer of ready-mixed concrete or concrete products may also adjust ceiling prices for increased costs attributable to increased freight rates on inbound freight. Resellers of these materials are permitted to make a similar adjustment.

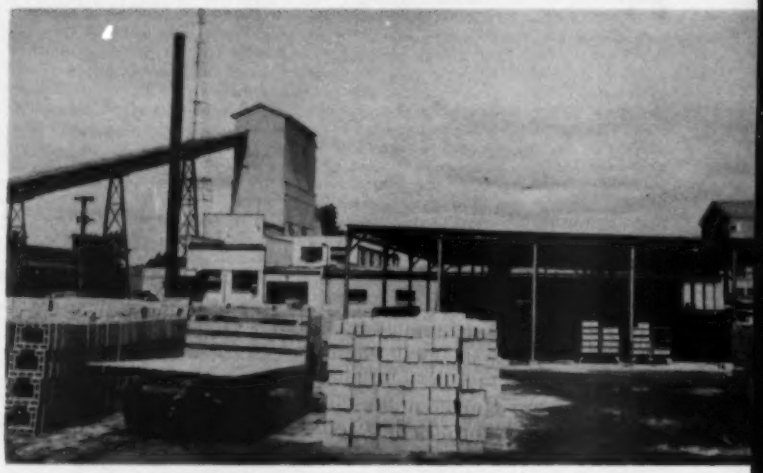
Detroit Block Plant's High Output Due to Close Control of All Operations

WHEN a concrete block manufacturer is able to turn out blocks of such high quality that few ever test under specifications, he usually feels that he is a good operator. In most cases, however, this is achieved by using a rich mix, with the result that most of the blocks produced are far stronger than necessary. At great cost to himself

By WALTER E. TRAUFFER

he is insuring staying above a minimum by maintaining an unnecessarily high average strength. That such expensive insurance is not necessary has been amply proved by the Standard Building Products Company of Detroit, Mich. This progressive firm has, since its formation in 1926, gradually improved its plant and methods until now, with its new plant built in 1949, it has produced up to 30,000 standard 8- by 8- by 16-in. sand-and-gravel blocks daily with a yield of 40 blocks per 94-lb. sack of high-early-strength portland cement.

Those who have attended the annual meetings of the National Concrete Masonry Association over a period of years or who have read reports of those meetings in these pages are probably familiar, in a general way, with the manner in which the above results are obtained. Benjamin Wilk, vice-president and general manager of the company, and past president of the Association, is regarded as one of the top production and technical experts in this industry and he has many times, at these conventions, mentioned or briefly described the methods used to obtain such startling results. This article is, however, believed to be the first complete description ever published of the manner in which these results are obtained.



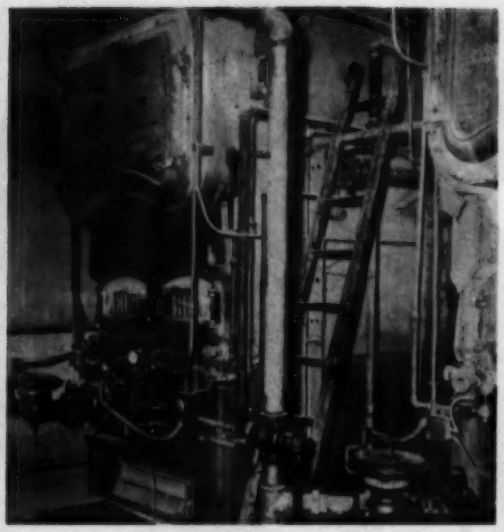
A general view of the yard and plant of the Standard Building Products Company at Detroit, Mich., showing also the covered storage building (right).

Some description of the history of the company and the background of the man primarily responsible for these results is necessary for a complete appreciation of what has been accomplished. Benjamin Wilk, better known to his many friends as Ben, is a civil engineering graduate of the University of Minnesota, class of 1914. Upon graduation he had two engineering jobs and then went to work for the old Universal Portland Cement Company in Chicago and spent 10 years in promotion, service, and engineering, including original concrete research work on concrete blocks. He has presented many papers before the American Concrete Institute and similar bodies and was one of the first to work with concrete block manufacturers toward the improvement of their product.

In 1926 Mr. Wilk went into partnership with Harry E. Brown as president, to form the Standard

Left: A truck-trailer combination dumping a load of accurately-sized aggregates into the plant hopper.

Right: The batch hopper and the scale on rails (left) at one of the three mixers it serves.



Left: One of the three high-capacity block machines with its mixer above.

Right: One of the two 150-hp. oil- and gas-fired boilers which supply steam for the kilns.

Building Products Co. in Detroit. Originally built to supply blocks for a housing development in which Mr. Brown was interested, this plant later became a commercial operation. In the 26 years which have since elapsed there have been four complete changes in the equipment. Starting out with hand-operated machines it went to semi-automatic, then to automatic tampers, and in 1940 to Besser Vibrapacs. Each change was not only an expansion but also a big step forward in the efficiency and economy of operation and the quality of the product. When replaced by the present plant in April, 1949, the old plant had two Besser Super Vibrapacs and a large tamper machine. The old plant building has since been used for assembling and storing aluminum windows, for which the company is a jobber.

The new plant is a model of efficient and high-capacity operation. A brief description of it will make it obvious why Standard's unusually high production records are possible. In the old plant there was too much variation in the gradation of the aggregates which were received by truck and elevated to bin storage, and the only control was in proportioning to the mixer. The curing facilities were inadequate as the boiler was too small, and the kilns were not properly insulated. As a result there was usually wide variation in the strength of the blocks, which made it necessary to use excess cement in order to keep all strengths above the 700-lb. specifications required by the city of Detroit. The yield averaged 28 or 29 standard 8- by 8- by 16-in. blocks per sack of high-early-strength cement, a figure which would satisfy most operators.

In designing the new plant, Mr. Wilk aimed at full control of aggregate gradation and blending, close control of proportioning, ample mixing time, adequate curing facilities, etc. The aggregates now used come from the same pit but are separated into three sizes — pea gravel, sharp sand, and flat (fine) sand. These are reblended to a theoretical fineness modulus of 3.70. The success of his efforts is evident from the fact that, largely because of the greater uniformity, one-third more blocks per bag of cement are now being obtained with the same cement and aggregates as formerly.

The aggregates are received in 15-cu. yd. truck-trailers which discharge to a 35-cu. yd. hopper. An inclined belt conveyor carries these materials to the top of the plant, where they are discharged into bins. There are six bins, so that both heavy and lightweight blocks can be made at the same time if desired. Bulk cement is received in specially-built trucks with screw conveyor discharge and is stored in a center bin. A motor-driven weigh larry with three aggregate beams and a cement beam is used for batching to supply the three Besser 50-cu. ft. mixers. Aggregates are fed to the larry through lever-controlled clamshell gates. Cement is fed through a 2-speed feed screw with automatic dribble control. No admixtures are used. Water is measured into the mixers by Neptune meters. This entire setup was furnished by the Butler Bin Company.

With this arrangement, one man does all the work on the batching floor. He can feed all materials to the batcher, move it to a mixer, dump the batch, and have the larry back for another batch in 3½ minutes. This makes it possible to keep an even cycle as each of the three 50-cu. ft. mixers holds enough concrete to supply its block machine for 11 minutes. The heavy-aggregate concrete is mixed 2 minutes dry and 6 minutes wet. The three Besser Super Vibrapac block machines are standard installations.

Lift trucks carry the 60-block racks from the block machine into the curing rooms. There are two rows of 11 kilns each, open at both ends, and on opposite sides of a middle corridor. Steam is supplied by two 150-hp. Kewanee Type C oil- and gas-fired boilers. Each kiln has an outside thermometer.

The curing method used is more or less standard in the Detroit area, where practices are perhaps a little ahead of those in the industry in general. When a kiln is filled and the doors are closed, there is a holding period of 2 hours. Then steam is introduced at one end of the kiln with enough velocity to carry to the other end and recirculate. The temperature in the kiln rises to 160 deg. F. in 1½ hours, and the steam is then shut off. After 12 hr. of soak-

(*Continued on page* 164)

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Katterjohn Builds Twin Block Plants At Paducah and Little Rock

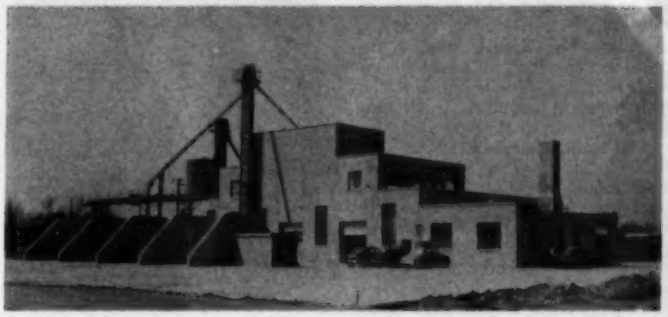
another ON THE SPOT report

AMONG the sizable group of industries which fall within our province it is a fairly common occurrence for successful entrepreneurs to design and build so-called dream plants, in the fond hope of eliminating a major share of the shortcomings native to the facilities with which they launched their careers. Such projects have made major contributions to progress in all branches of industry, for they invariably provide an enduring and completely readable record of the knowledge that successful individuals have acquired through experience.

By WILLIAM M. AVERY

All undertakings of this character are newsworthy, and in these pages we have reported many of them in considerable detail. But the event surely falls into a special category of newsworthiness when one individual simultaneously builds *two identical* dream plants. The entrepreneur in this case is George W. Katterjohn Jr. of Katterjohn Concrete Products, and the two plants are located at Paducah, Kentucky, and Little Rock, Arkansas.

Inheritor of a century-old contracting business, Mr. Katterjohn branched out into the block business in 1939 when he established his first plant at Paducah. The venture prospered and output increased steadily during the intervening years, soon running far in excess of the volume anticipated when the plant was originally laid out. In recent years production had ranged from 1¼ to 1½ million units a year, but operations were carried on under almost impossibly crowded conditions.



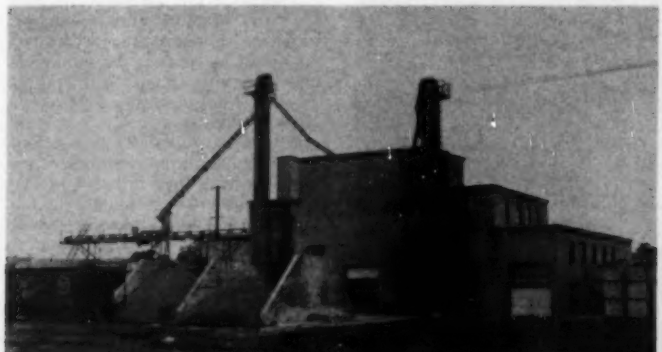
• A general view of the new Paducah plant of Katterjohn Concrete Products, taken just before the facilities went into operation.

The business was expanded in 1947 with the construction of a new plant at Owensboro, Ky., and in this project Mr. Katterjohn avoided many of the inherent site and layout faults which had proved to be such a serious handicap in operations at Paducah. With the new plant as a yardstick, it became increasingly evident that the creation of comparable facilities at Paducah would yield important savings in production costs alone.

But a far more decisive argument arose as a result of the tremendous industrial development of the Paducah area during the years following World War II, creating a much larger potential market for concrete masonry units. With the original facilities already operating at maximum capacity, a new and more efficient plant became a matter of urgent necessity.

While this project was in the planning stages, Mr. Katterjohn had occasion to spend several days in Little Rock, and noted during the course of his stay that this city of well over 100,000 population had no large producer of concrete block. Investigation indicated that the area could well support a modern, high-capacity block plant, and that considerable quantities of masonry units were actually being trucked into the city from a distance of about 165 miles. Any market, Mr. Katterjohn reasoned, that wanted block that badly was probably a good enough market to support a modern local plant. At any rate, a separate corporation was organized for operations in Arkansas, and the two plants were studied, at least from the standpoint of layout and design, as though they represented a single project.

Design Incorporates Generous Provisions for Future Growth



• Exterior view of the Little Rock plant, taken from about the same relative vantage point, shows the striking similarity of the two projects. The chief difference is in the location of the rail siding and of the cement storage silo.

The two installations are identical except for a very few minor details, and each represents an investment of approximately $250,000 exclusive of land. The design represents the combined thinking of Mr. Katterjohn, who is a competent contractor in his own right, and engineers of the Besser Manufacturing Company, the Erie Steel Construction Company, and the E. F. Marsh Engineering Company. Morris Gross of Detroit served as consultant on all matters pertaining to curing.

The basic structure is 100 ft. wide by 150 ft. 9 in. long, these dimensions being based on the eventual operation in each plant of three Besser Super Vibrapac block machines. Of the total length approximately 82 ft. is occupied by the machine room and the remainder by the curing kilns. Repair shop, boiler room, and employees' locker and shower rooms are in a 60- by 30-ft. extension to the machine room, so that these auxiliary facilities do not in any way interfere with manufacturing operations.

All exterior walls are of 12-in. concrete masonry units, and free standing structural steel columns and girders support the F & A roof system which covers the entire plant. The 208-cu. yd. 4-comp-aggregate bin, supported on free-standing steel columns, is entirely enclosed within the main structure, thus automatically providing for the heating of aggregates during cold-weather operations.

The materials-handling system is as flexible and compact as any we have seen. It provides separate under-track hoppers for receiving rail shipments of both cement and aggregates, as well as a third hopper for receiving truck shipments of

• George W. Katterjohn, president of the company, is a past president of the National Concrete Masonry Association, and a leading light in the activities of the Southeastern Division of that organization.

aggregates. An underground screw conveyor delivers cement from the track hopper to a bucket elevator which can discharge into an 872-bbl. Erie CSB ground storage silo or, by means of a chute and an overhead screw conveyor, into one compartment of the inside plant bin. These same facilities, of course, are utilized to reclaim cement from the storage silo and deliver it to the bin.

In somewhat the same fashion, the identical facilities used for placing aggregates into storage are also used for reclaiming and feeding them to the plant bin. This somewhat unusual feature was achieved by extending the reclaiming tunnel, located under the aggregate storage piles, to the rail siding, so that the track hopper discharges directly onto one of the three 18-in. belt conveyors in the tunnel. Conveyor No. 1 discharges onto a cross conveyor (No. 2) which in turn delivers the flow to the aggregate elevator. A gate at the top of the elevator directs the material into either of two gravity chutes, one terminating at a turnhead over the plant bins and the other at a turnhead over the storage piles.

Five concrete masonry division walls separate the storage area into four pockets, each of which has a capacity of about 300 tons. The turnhead, which is located above the middle division wall, can discharge into either of the two center pockets, or onto a reversible 18-in. belt conveyor which can discharge into the end pockets.

The storage area is fully paved, and each pocket has two draw points (manually operated clamshell gates) through which the materials flow onto the reclaiming conveyors in the tunnel. The two conveyors in the main tunnel run in opposite directions in order to discharge onto the lateral conveyor which terminates at the plant elevator. By locating the truck receiving hopper directly above it, the lateral conveyor was also made to serve as a means of introducing trucked materials into the handling circuit.

The materials-handling system has a designed capacity of about 75 t.p.h. of aggregates and about 50 t.p.h. of cement. Erie Steel Construction supplied both bucket elevators, and all four conveyors were furnished by E. F. Marsh. Sidewalls of the reclaiming tunnel are of 12-in. concrete masonry units, and these support a 12-in. monolithic reinforced concrete slab from which the main conveyors are suspended. Lights recessed in the ceiling give excellent illumination throughout.

The plant bin, furnished by Allison Steel Manufacturing Company, provides storage capacity for 69 cu. yd. of material in the totally enclosed cement compartment, and 40, 48 and 52 cu. yd. in the three aggregate compartments. The bin compartments and the 2-cu. yd. Erie traveling weigh batcher below are equipped with Branford air vibrators to assure free flow of materials. The batcher operates in conjunction with a 4-beam Hardy scale.

As mentioned above, each plant is laid out for three block machines, providing a generous margin over and above the immediately required capacity. The Little Rock plant, which was the first of the two to get into actual production, has just one machine. The Paducah plant operated initially with just one machine,

• A closeup of the aggregate storage facilities at Paducah. The conveyor above the concrete masonry division walls is reversible so that it can discharge into either of the end pockets.

but as soon as production was established, an older machine was moved from the original plant to the new building and is now in operation. All three machines are Besser Super Vibrapacs, and the same company furnished the 50-cu. ft. batch mixers.

The mixers are located in concrete pits about 4 ft. below the level of the machine floor, and the machine hoppers are charged by means of skiphoists. While he doesn't discount the desirability of gravity material flow from the bins to the block machines, Mr. Katterjohn believes that the important operations of batching and mixing can be supervised far more effectively if they are not partially isolated on a balcony.

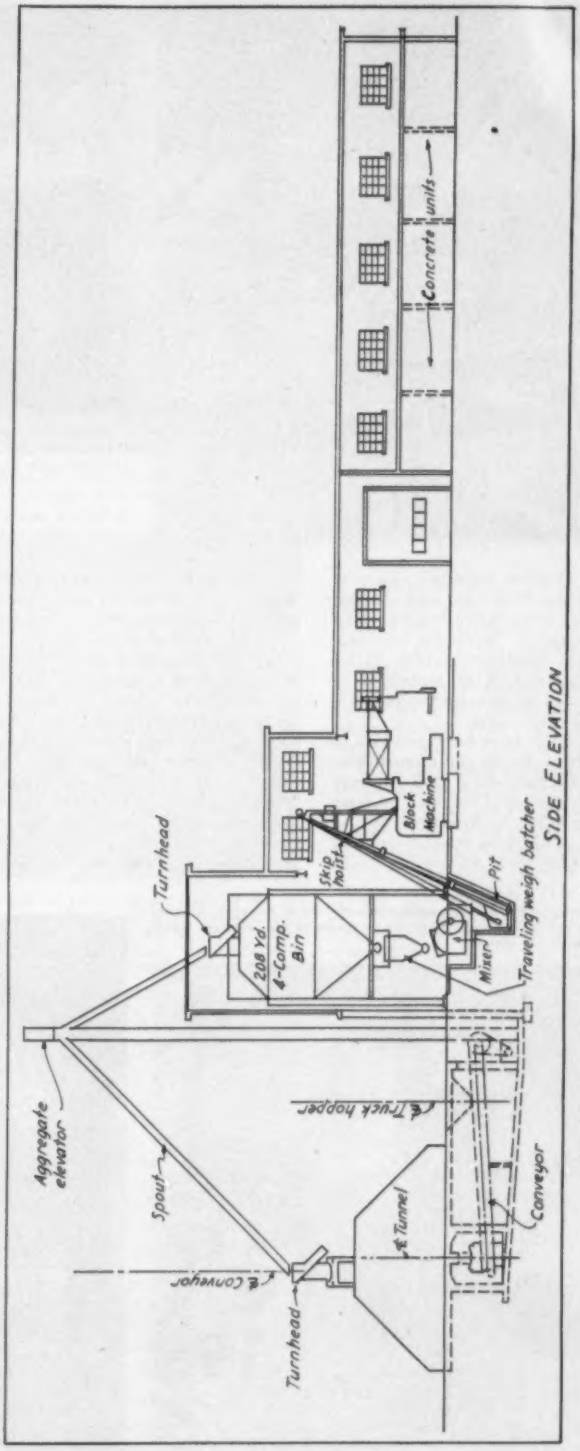
The installations are noteworthy for the unusually generous clearances provided in the machine room areas. There is a clear distance of almost 40 ft. in front of the machines, and the layout calls for 23 ft. between centerlines and 26 ft. from centerlines to adjacent sidewalls.

Another outstanding feature is the provision for artificial illumination. More than twenty 500-watt G. E. sealed beam lamps are strategically located throughout the plant proper to provide excellent overlapping illumination in all working areas. At night or on overcast days, by flicking a few switches the machine room can be lighted up like a baseball field. To assure natural illumination and circulation of air, generous areas of ventilated sash were built into the walls of the buildings.

Green units are loaded two pallets (six units) at a time into steel racks which accommodate 72 8- by 8- by 16-in. blocks or equivalents. Power lift trucks pick up the racks and transport them to the curing rooms. Two 3-ton Clark fork lift trucks are in service at Little Rock and Paducah, but the latter plant also has a 2-ton Towmotor and an Erickson platform lift truck.

There are ten curing rooms, arranged five on each side of a 30-ft. wide aisle which opens on the machine room at one end and on the storage yard at the other. The rooms have a clear width of 12 ft. 6 in. and are 38 ft. 10 in. long. Each is designed to hold 22 racks or a total of 1,584 standard units per room. Clear height at the center of each room is 7 ft. 7 in.

The interior walls are protected from damage by 4-in. wide by 12-in. high bumper curbs which run the full length of the rooms at floor level, and the floors slope $\frac{1}{16}$ of an inch per foot to troughs located in the aisle and covered with cast iron gratings in order to drain off conden-



SIDE ELEVATION

• This elevation drawing of the Paducah plant shows all major facilities except those used for handling and storing cement.

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As mentioned above, each plant is laid out for three block machines, providing a generous margin over and above the immediately required capacity. The Little Rock plant, which was the first of the two to get into actual production, has just one machine. The Paducah plant operated initially with just one machine,

but as soon as production was established, an older machine was moved from the original plant to the new building and is now in operation. All three machines are Besser Super Vibrapacs, and the same company furnished the 50-cu. ft. batch mixers.

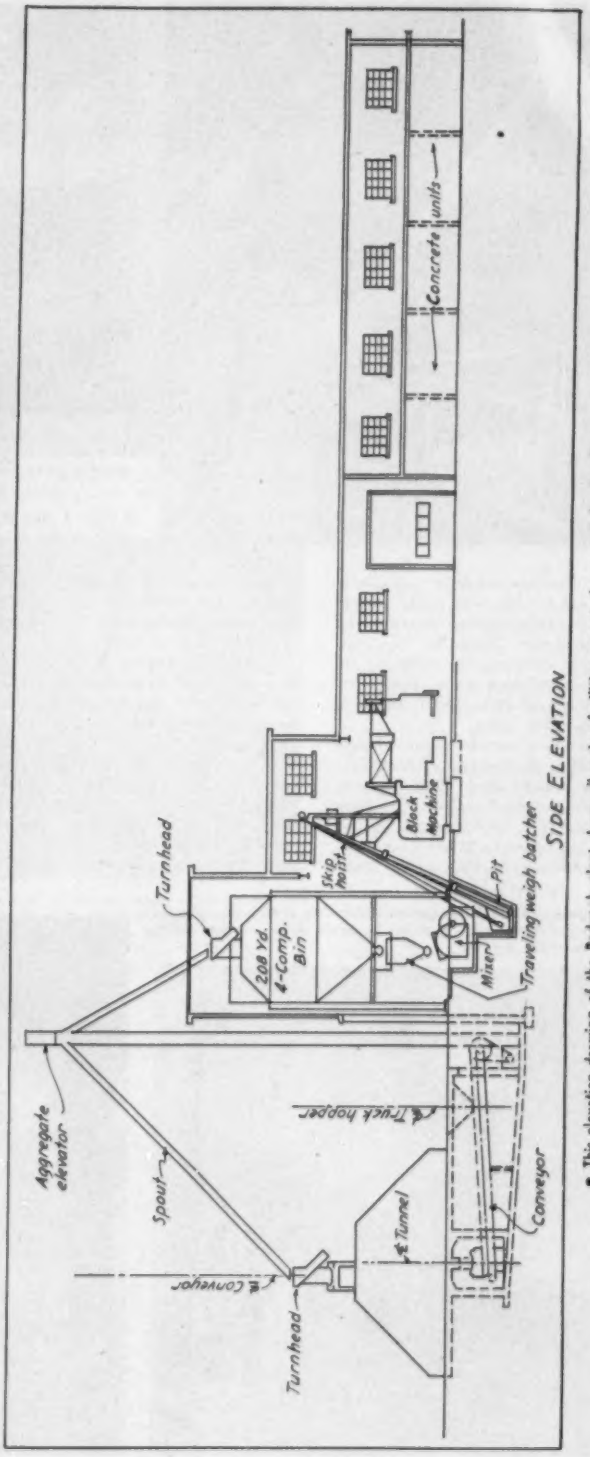
The mixers are located in concrete pits about 4 ft. below the level of the machine floor, and the machine hoppers are charged by means of skiphoists. While he doesn't discount the desirability of gravity material flow from the bins to the block machines, Mr. Katterjohn believes that the important operations of batching and mixing can be super-

PAGES

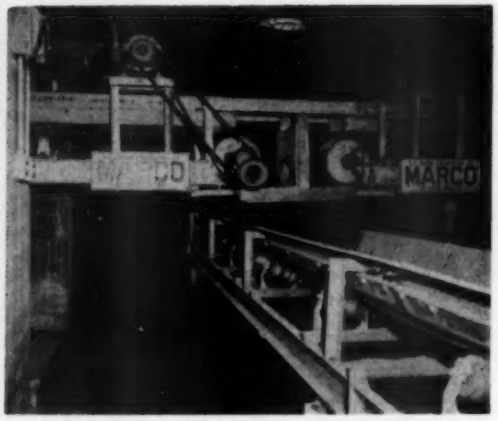
ducah, but the latter plant also has a 2-ton Towmotor and an Erickson platform lift truck.

There are ten curing rooms, arranged five on each side of a 30-ft. wide aisle which opens on the machine room at one end and on the storage yard at the other. The rooms have a clear width of 12 ft. 6 in. and are 38 ft. 10 in. long. Each is designed to hold 22 racks or a total of 1,584 standard units per room. Clear height at the center of each room is 7 ft. 7 in.

The interior walls are protected from damage by 4-in. wide by 12-in. high bumper curbs which run the full length of the rooms at floor level, and the floors slope $\frac{1}{8}$ of an inch per foot to troughs located in the aisle and covered with cast iron gratings in order to drain off conden-



• This elevation drawing of the Paducah plant shows all major facilities except those used for handling and storing cement.



• Above: The belt conveyor in the loading and reclaiming tunnels at Little Rock. The two cross conveyors are fed through manually-operated gates under the storage piles.

• Left: A view of the 50-cu. ft. batch mixer and the Erie traveling weigh batcher at Little Rock.

sation. Exterior walls are of cavity construction with 4-in. units outside and 8-in. units inside, separated by 2-in. air spaces. Roofs are of standard 4-ply construction with ½ in. of insulation, and are supported by F & A joists and cinder concrete masonry filler units.

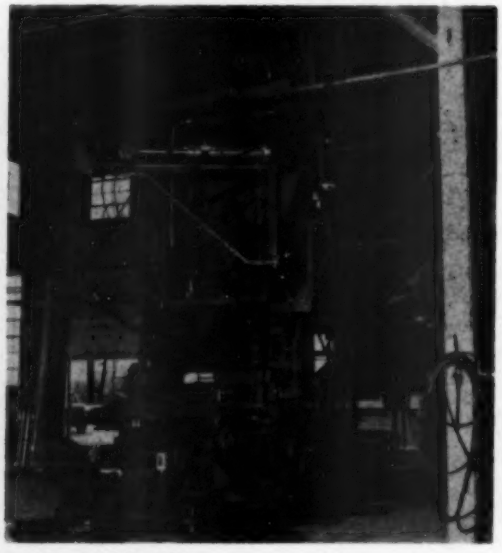
Trap doors have been provided in the roofs at the far end of each kiln, and eventually these will be connected by means of ductwork to large fans (one for each battery of five rooms) in order to exhaust steam at the conclusion of the curing cycle. Closures at present consist of canvas curtains, but the design contemplates the future installation of power-operated vertical doors.

Steam is supplied by a 125-hp. Kewanee Type C automatic natural-gas-fired boiler housed in a separate room adjoining the machine room. It is piped to 4-in. diameter headers mounted above the kiln doorways. The smaller pipes which actually carry the steam into the kilns are connected to the tops of the headers in order to prevent the injection of water. Control is by means of manually-operated valves, but it is planned to install thermocouples in each kiln which will actuate visible and audible signals when temperatures reach some predetermined level—probably about 170 deg. F. The total length of the curing cycle is 12 to 14 hrs.

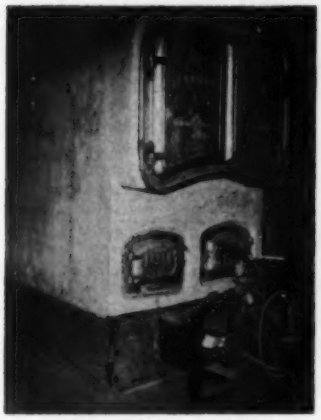
At both plants cured units are assembled in cubes as soon as they are removed from the kilns. The generous amount of space in front

• A general view of one of the block machines in the Paducah plant. A second machine has been installed to the right of this unit, and there is space to the left for the eventual installation of a third machine.

• A closeup of the 872-bbl. cement storage silo at Paducah. Cement is transferred to the inside plant bin by means of the conveyor visible at the top of the picture.



• This view of the reclaiming tunnel at Paducah shows the truck receiving hopper mounted just ahead of the point at which the cross conveyor discharges into the aggregate elevator.



• The 125-hp. automatic gas-fired boiler at the Little Rock plant.

• One of the ten curing rooms at the Paducah plant. Note the high penthouse over the connecting aisle and the excellent provision for natural lighting. Vertical lift doors will eventually replace the canvas curtains now in use.

of the block machines makes it possible to perform the cubing operation inside the building when weather conditions make this desirable, or the work can be done at other times on the large paved areas surrounding the plants. The work of assembling cubes is considerably facilitated by the use of air-powered yardhoists. Two of the original Millard Warren yardhoists (one for each block machine) are in service at Paducah, and a new Besser unit has been purchased for the plant at Little Rock. Cubes of standard units are picked up by engaging the bottom tier core spaces with the forks of the lift trucks, while concrete brick, half-size units and specials are handled on wood pallets.

Extensive paving was done on the areas surrounding both plants as an integral part of the construction work to provide for an ultimate maximum capacity of about 250,000 8-in. equivalents at each location. Each of the sites comprises about 4½ acres of ground.

The plant at Paducah uses screened power-house cinders for making lightweight units, and crushed limestone for so-called heavyweight block. In the past the latter type has accounted for approximately 60 percent of total production. At Little Rock haydite is used for lightweight units, and sand and crushed granite for heavyweight. Since both plants are conveniently close to sources of supply, the provisions made for storage are believed to be more than ample.

The Paducah plant is located on an excellent piece of property just a quarter of a mile from the Ohio River and only a block from the new highway belt line which encircles the city, providing easy access to both industrial and residential areas. The $500,000,000 atomic energy plant recently increased to $950,000,000 on which construction work started about a year ago, is only about 12 miles away. Two huge electric generating plants are also under construction in the Paducah area—one by the TVA on the Kentucky side of the river, and one by the Electric Energy Corporation on the Illinois side. These and other sizable projects in the offing are expected to create a boom market for concrete masonry for some years to come.

Although a considerable amount of basic market development work remains to be done in the Little Rock area, the potential there seems equally good. A number of large industrial operations have been established within 75 miles of the city, and there are strong indications that others will move in. There is also a great deal of housing construction actually under way, as well as in prospect. The plant is located in the heart of a rapidly developing industrial area in North Little Rock, and it is close to all the main highways.

All block manufacturing at Paducah is now carried on in the new plant, but production of septic tanks, burial vaults, F & A floor systems and similar work is being maintained at the old location. For the present, at least, the company plans to concentrate its efforts on developing the block market at Little Rock, but eventually other lines will be added.

The new Katterjohn plants have been in production for only a short time, and it is much too soon to attempt to appraise them from the standpoint of performance. In respect to design, layout, and arrangement, however, they clearly represent important landmarks in the block industry's forward progress. Mr. Katterjohn and all who were associated with him in this major undertaking deserve to be congratulated upon a job well done.

A scale model of the exhibit building to be erected for the Washington County (Ore.) Fair was presented recently to fair promoters by S. Carl Smithwick, president of Smithwick Concrete Products, Portland, Ore., the firm furnishing the block for the structure. The miniature, built to the exact scale dimensions, will be displayed in various cities of this area.

New and Efficient Plant Of Sherman Concrete Pipe At Decatur, Georgia

another ON THE SPOT report

By WILLIAM M. AVERY

WHEN the Southeastern Division of the National Concrete Masonry Association met at Atlanta, Ga., in the fall of 1949, a feature of the gathering was an inspection trip to a new plant which Sherman Concrete Pipe Company was then constructing on the outskirts of the city of Decatur. The hundred or more block producers who made the trip were primarily interested in the F & A roof system with which the extensive kiln area was being covered, but there were a number of other features of design and layout which we felt certain would be of interest among our readers in the concrete pipe industry. We accordingly returned to Decatur at the first opportunity to secure photographs and information for a more detailed report than could possibly have been obtained while the property was under construction.

The company describes the layout as a basic one in that full provisions have made for the future installation of overhead steel bins and a bulk cement plant. For the present, however, ground-level concrete bins are utilized for storing aggregates, and bagged cement is used exclusively in all mixes. Despite these apparent violations of modern design principles, the facilities have been arranged in such a way as to achieve a very satisfactory degree of manpower efficiency.

The main building is a steel frame structure covered with corrugated steel sheets. Measuring 57 by 120 ft., it houses the two pipe machines and the mixers, conveyors, and skip-hoists which serve them, as well as such auxiliary facilities as those used in forming reinforcing steel cages. The three reinforced-concrete bins already referred to adjoin one of the long walls of the machine room, and are located between the building and the rail siding which serves the plant.

The bins, each holding a little over two carloads of material, are filled by means of an undertrack hopper, a short belt conveyor feeding a chain bucket elevator, and a selector chute which can be adjusted to direct flow into any one of the three pockets. A built-up roof supported by timber decking protects the three compartments from the weather. Materials are withdrawn from the bins through vertical gates in the retaining walls which face into the machine room, the removal being accomplished by means of hand shoveling into wheelbarrows.

The aggregates used consist of natural sand and graded crushed granite obtained primarily from nearby Stone Mountain. Although normally all material comes into the plant by rail, the receiving facilities are adaptable to truck deliveries when necessary. A carload of stone can be unloaded in about two hours, whereas a car of sand requires up to four hours. Except for a stretch of around 100 ft., the rail siding has a 2¼-percent grade to facilitate the handling of cars.

W. C. Louis, manager of the Sherman plant at Decatur.

Bagged cement is stored in a 12- by 30-ft. shed which adjoins one end of the machine room. This storage shed also opens onto a paved runway over which cement is wheeled from box cars spotted on the rail siding. About two carloads of the material can be stored, and clearances are such that both cement and aggregates can be unloaded simultaneously without interference.

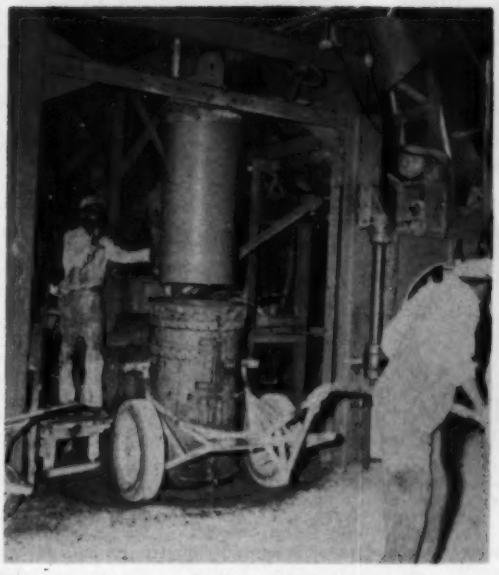
Pipes in the diameter range of 6 to 18 in. are molded with a McCracken Model R packerhead machine, while a Universal-type tamp machine is used for units ranging from 12 to 60 in. in diameter. Units above 60 in. in diameter are produced in both tongue-and-groove and bell-and-spigot types by casting, this work being done in a separate shed adjacent to the curing rooms.

The pipe machines are served by separate 30-cu. ft. Besser batch mixers located in shallow concrete pits just a few feet from the lift gates which provide access to the aggregate storage compartments. Transfer of the mix to the machines is by means of an inclined drag conveyor in the case of the packerhead unit, and of a skiphoist, a supply hopper, and a drum feeder in the case of the tamp machine. Steel wire mesh is cut, formed, and welded into reinforcing cages in a lean-to shed which opens onto one end of the machine room.

The plant was built with four curing rooms each having a clear width of 21 ft. 6 in. and a length of 100 ft. 6 in., but within recent months two rooms of the same size were added. The rooms all open onto the machine room at one end and onto the storage yard at the opposite end. Side walls and partitions consist of 8- by 8- by 16-in. concrete masonry units, and the entire area is covered with an F & A

A general view of the Sherman Concrete Pipe Company's plant at Decatur, Ga., on the outskirts of Atlanta. The machine room is at the left; the steam kilns at the right.

Pipe from 6 to 18 in. in diameter are made with this packer-head machine.



This tamp machine makes pipe 12 to 60 in. in diameter.

roof system. This consists of precast inverted "T" beams supporting cinder filler block and topped with 2½ in. of reinforced monolithic concrete. As shown by the accompanying photograph, taken while the roof was under construction, the top edges of the joists are serrated to assist bonding with the slab. Heavy building paper inserted under the joists where they rest on the walls permits the entire roof to slide freely when expansion and contraction occurs. According to the plant manager, the installation has been entirely successful; and after three years of service there is absolutely no evidence of sagging, cracking, or other serious faults.

Steam for curing is supplied by a Pacific Type "L" 42-hp. automatic oil-fired boiler which is housed in a separate concrete masonry building. There is a 6,000-gal. steel tank for storing fuel oil.

The method of injecting steam into the curing rooms is new to us, but we understand that it was developed several years ago by F. B. Gray, president and general manager of the Gray Concrete Pipe Company, Thomasville, N. C. The steam is actually released under water in a shallow concrete trough which extends along one wall of each kiln for its entire length. Each trough contains a 1¾-in. diameter pipe supported on sleepers to keep it clear of the bottom, and there are downward angling jets on 12-in. centers throughout the length.

The F & A roof being inspected by members of the Southeastern Division, N.C.M.A., while the plant was still under construction. The precast joists support a clear span of 21 ft. 6 in.

A closeup of one of the water troughs into which steam is injected to produce a dense, low-hanging fog for curing.

One of the 30-cu. ft. batch mixers. At the right is one of the ground-level storage bins for aggregates.

Injection of the steam through water in this manner is said to create an exceptionally dense, heavy, low-hanging fog in the curing rooms, and to result in equally favorable curing conditions at both the floor level and the ceiling. Although no dry heat is introduced, temperatures up to 115 or 120 deg. F. can readily be maintained.

Steam is introduced over a total period of about 12⅛ hours, starting at about 6:30 each evening, some two hours after the pipe machines are shut down. The fog produced is so dense that in the morning one member of the working force reports an hour ahead of the rest of the crew in order to open the doors and have enough of the vapor cleared out so that unloading operations may proceed. The general effectiveness of the curing cycle is indicated by the fact that some sizes of the pipe come up to specification strength requirements the day after they are manufactured.

The plant is located on a 6½-acre property served by the Georgia Railroad, the main line of which parallels the plant siding. In leveling and clearing the site before construction began, it was necessary to move some 16,000 cu. yd. of dirt. This work, however, made it possible to utilize the entire area for inventory storage if it should ever prove desirable to accumulate so large a tonnage of finished pipe.

Depending on the volume of production, total employment ranges from 20 to 40 individuals. W. C. Louis is manager and J. H. Shellnutt is plant superintendent. In addition to the production unit at Decatur, there are four Sherman plants in the state of Florida, two in Alabama, and four in Tennessee.

Close Control at Standard

(*From page* 155)

ing, the steam is drawn off through an opening in the roof by a suction fan. After 45 minutes the opening is closed to keep in the heat and the blocks remain in the kiln until

Some of the curing rooms, showing external thermometers.

the end of the 24-hr. cycle. In cold weather, of course, allowance must be made for warming up the kilns on Monday mornings, and the blocks are given a 1- to 2-hr. warm-up in the kilns, this time being taken off the soaking period.

Mr. Wilk believes that every block manufacturer can profit by having his aggregates broken down and then recombined. His investigations have shown that good results can be obtained with any sound aggregate if the fineness modulus is kept between 3.60 and 3.90 or 4.00. With his aggregate he tries for the following gradation:

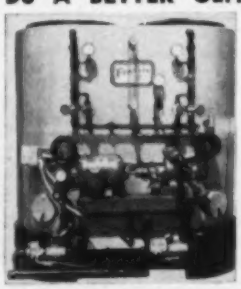
		Percent
Retained on	4-mesh sieve	25
Retained on	8-mesh sieve	40
Retained on	16-mesh sieve	55
Retained on	28-mesh sieve	70
Retained on	50-mesh sieve	85
Retained on	100-mesh sieve	95
		F. M. 3.70

In this mixture is 50 percent pea gravel with an F.M. of 5.35, 34 percent of sharp sand with an F.M. of 2.66, and 16 percent of flat sand with an F.M. of 1.85.

The concrete mix is designed for a compressive strength of just over 1,000 p.s.i. at 7 days. Under ordinary circumstances very few blocks test under that figure and very few over 1,200 lb. The absorption of these blocks is also very low, averaging about 5 percent in terms of dry weight, considerably below the average in the industry. A further advantage, according to Mr. Wilk, is that, due to the very lean mix, the shrinkage in these blocks is almost negligible. Deliveries are safely made at from 4 days up.

Concrete block producers and users in the Detroit area are fortunate in having as chief chemical and testing engineer for the Detroit department of buildings William Grant, who is very sympathetic to the block industry and has been of great help to them in their efforts to make the best possible product at the lowest price.

REDUCE Curing Costs . . . SPEED Curing Time
Do A BETTER Curing Job . . . with FRANCIS
STEAM GENERATORS



- Fully-automatic FRANCIS generators provide concrete-block plants with flexible, low-cost heat and humidity, so necessary for proper and rapid curing.
- Combined heat and moisture—or either semi-dry or saturated steam—may be generated as desired.
- Other features: no steam engineer required; steam up in 3 minutes from a cold start; twin units for standby protection; descaling system keeps coils clean. Costs half that of a conventional boiler.
- *Write for full particulars!*

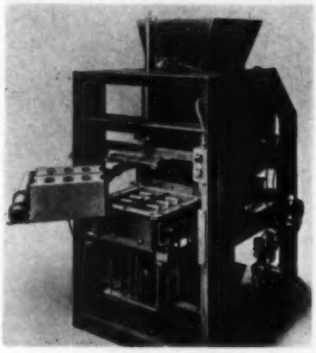
Francis Steam Generator Co., Inc.
10202 E. Artesia Avenue, Bellflower, California

NEW MACHINERY and SUPPLIES

● Two-Unit Block Machine

The "Duplex Blockmaker" has been developed by the Kent Machine Company, Cuyahoga Falls, Ohio.

The new model is similar to the standard machine but produces two blocks



per cycle. Interchangeable mold boxes may be used to produce the standard sizes of block.

The machine has three rotary agitation shafts in the feed drawer, and a swinging manual take-off or one designed for an air-operated off-bearer. High production and low power costs are additional features claimed.

● Masonry Prime Coat

A prime coat for sealing masonry surfaces has been developed by the Medusa Portland Cement Company, Cleveland 15, Ohio.

The material, "Medusa Ruf-Seal Cement Paint", was perfected primarily for use on extremely porous lightweight aggregate blocks. The porosity of these blocks has made painting difficult due to the varying absorption of the surface. This prime coat fills the pores in the block and provides a surface for the application of paint. It is mixed with water and applied with a scrubbing brush. Only 25-lb. containers in white are offered.

● Aluminum Windows

Aluminum double-hung windows for residences are being manufactured by Ceco Steel Products Corporation, 5601 W. 26th Street, Chicago 50, Ill.

The line includes four types of standard sash and a line of picture windows in all sizes. Screens and storm sash are available to fit. The entire line of Ceco-Sterling windows are made of aluminum with all joints and corner welded. They are said to be proof against warping, shrinking, or rotting.

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Specify Super-Service

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STEEL ELEVATOR BUCKETS

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(Style No. 2 shown)

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High-economy STANDARD Buckets are available in all styles, types, sizes and gauges.

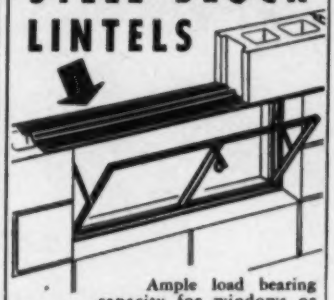
We are equipped to furnish new units or recondition present equipment at minimum cost.

STANDARD METAL MFG. CO. Malinta, Ohio

For better, stronger window installations

VENTO

STEEL BLOCK LINTELS



Ample load bearing capacity for windows or doors. Available from 2-ft. 6-in. to 5-ft. Formed from 10 gauge hot rolled steel with stiffening crimp in center. Beveled edge provides masonry bond and seat for mortar. Saves costs through use with standard 8-inch blocks. Vento pressed steel angle lintels for brick construction also available.

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VENTO "CHAMPION"

Three sizes. Effortless operation gives three position ventilation and sash removal. Double contact with leak-proof water-shed sill stops wind and rain. 14 gauge electric welded frame. Fins welded to jambs for easy installation in block or poured walls.

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A real economy window for lower cost housing. Three sizes, sturdy construction, smooth operation, two position ventilation and easy sash removal. Fin flanges at jambs for quick installations.

Also casement, utility and barn windows. Write for full information.

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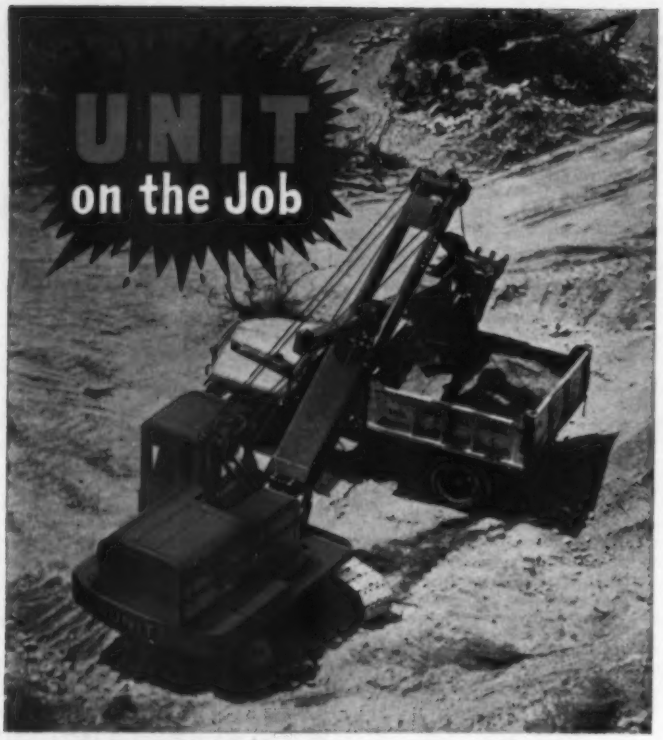

SWING SPEED makes PAY LOADS!

Here's a UNIT ½ Yard Shovel doing a PRODUCTION DIGGING JOB in a gravel pit. UNIT owners like the ease of operation and the FULL VISION CAB for complete visibility. They also like the sturdy construction and the many mechanical features, plus the ECONOMICAL PERFORMANCE and LOW UP-KEEP which all add up to EARNING POWER. Why not investigate what UNIT can do for you — on YOUR next excavating and material handling job?

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All Models Convertible to ALL Attachments!

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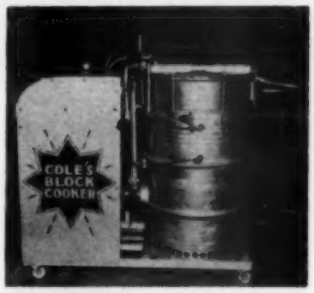
● Block Curing Machine

A portable block curing machine "Cole's Block Cooker" is being manufactured by the A. J. Cole Company, Chillicothe, Mo.

The block curing machine contains an oil burner that heats a combustion chamber. Air is drawn around this chamber and is super heated. Jets of water are directed into the heated air to moisten it before it is drawn into the



fan. The superheated moistened air is then discharged through an 8-in. pipe. It is claimed that this unit will cure 1,000 blocks in 6 to 8 hours.

The machine is entirely portable and may be moved from kiln to kiln to provide continuous curing.

● Masonry Blade

A break resistant blade for masonry cutting is being produced by the Victor Engineering Corporation, 27 Maplewood Avenue, Philadelphia 44, Pa.

The "Valsafe" is composed of nylon and abrasives to give a blade of strength and cutting qualities. It is available in many diameters and arbor holes and will cut concrete products, stone, and clay products.

● Tractor Lift Truck

A lift-truck that embodies a tractor's ability to operate on soft or uneven ground with the handling features of a lift-truck is being manufactured by the Tracto-Lift Company, 2011 Baltimore Avenue, Kansas City 8, Mo.

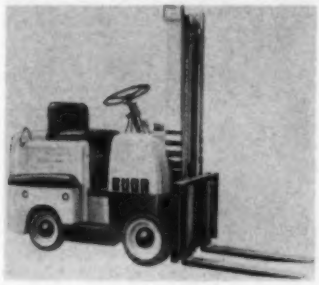
The new machine utilizes a standard heavy-duty industrial tractor with minor

modifications such as reversing of the transmission, tractor seat, and steering mechanism, and the addition of counterweights. A fork lift, of 3,000; 4,000; 5,000; or 6,000-lb. capacity, with fork lengths from 30 to 60 in. and lifts to 12¼ ft. is mounted on the front.

● Fork Lift Trucks

A completely new series of fork lift trucks has been announced by the Buda Company, Harvey, Ill. These trucks are said to embody the latest developments in engineering, styling, accessibility, and operating performance.

The "FT" series of lift trucks includes 12 models with solid or cushion tires and capacities from 3,000 to 7,500 lb. at



24-in. load center. Over 85 percent of all replaceable parts are interchangeable between all 12 models. All models may be had in standard mast heights of 72-in., 84-in., 108-in., 114-in., and 120-in. lift.

Power is supplied by either a Buda gasoline or a Buda diesel engine of identical displacement, bore, stroke, and mounting dimensions. Two speeds forward or reverse are controlled by a single gear shift lever, and a heavy-duty clutch.

● Reinforced Masonry Blade

A reinforced blade for masonry cutting that is claimed to be virtually indestructible and completely safe is being marketed as the Eveready "Tuffie" reinforced masonry blade by the Eveready Briksaw Company, 1509 S. Michigan Blvd., Chicago 5, Ill.

The Tuffie is reinforced internally with

layers of a strong fabric, and a safety web is molded into the surface. It is able to withstand twisting and binding strains and so is applicable to hand power saws. The Tuffie blade is particularly recommended for use on concrete and cinder block and similar materials. Sizes range from 12 to 18 in. for masonry saw use and from 6 to 8 in. for hand saws.

Carl Peterson, former president of the Ideal Cement Stone Company, Omaha, Nebr., died recently in that city. Mr. Peterson and his brother, N. J. Peterson, founded the firm in 1905.

The NEW Brickmaster

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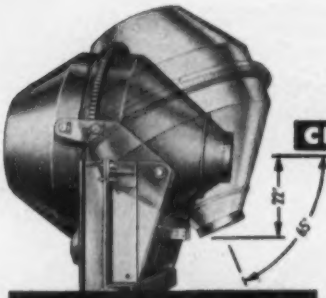

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As it requires less headroom, the TILT-UP SuPREMIXER is the only mixer feasible in most plants. It's easy to install, no raising of the plant or lowering of drive.

FOR A PACKAGE PLANT
Reduced headroom requirement means reduced height, construction and power costs. Efficiently permits dry batch in one tank, central mix in the other.

FOR A SEMI-PORTABLE PLANT
Crane feeding is easy with SuPREMIX. Separate A-frame mounting with bin structures bolted for quick, easy set-up provide real flexibility for your cash-defense jobs.

Only the SuPREMIX TILT-UP, 3-3½ yard hydraulically controlled mixer can give you *all* these advantages: lower headroom requirements—steeper discharge of 65°—no segregation—reduced thrust—and virtually fixed discharge. The hydraulic system is part of the unit—no costly compressor to buy. The unique features of this mixer make it the ideal mixer...

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● Stone Faced Blocks

A method for stone facing blocks with a ⅜-in. marble aggregate facing has been developed by the Knighton Franchise Distributing Company, 3053 Highland avenue, Birmingham, Ala.

The process results in a concrete block of standard materials and size with a tile-like facing in either white or colors. The facing is similar to glazed tile in appearance and is waterproof. Double- and single-face units may be made that are decorative and durable.

The facing is an integral part of the block, made as it is formed to avoid the possibility of a bond being loosened by condensation or freezing. Blocks are especially suggested for use in exterior walls, kitchens, corridors, school dining rooms, and other places where waterproof, easily-cleaned surfaces are desired.

● Concrete Additive

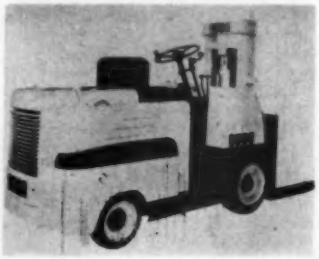
An additive that reduces the weight of concrete by entraining controlled amounts of air has been introduced by the Chemicals Division of the VanHoven Company, St. Paul, Minn., under the name of "Cemtein".

The material, a protein substance, is said to improve workability, lessen heat tranfer, improve waterproof properties, and lessen water absorption. The use of Cemtein is claimed to make possible concrete weighing 110 lb. per cu. ft. with about a 25 percent reduction in ingredients needed.

● Lift Truck

A 6000-lb. capacity lift truck is being produced by the Buda Company, Harvey, Ill.

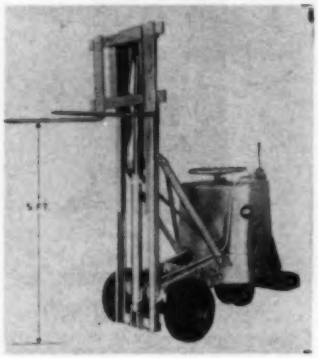
The new machine is being made with either gasoline or diesel engine power. Lifting heights from 72 to 120 in. are available on this series of trucks. Other features include a single lever gear shift; heavy-duty industrial type clutch; complete set of electrical gauges; and accessibility of all parts for maintenance. The new models are designated as the FT60-24 and the FTD60-24.



● Fork Lift Attachment

A 5-foot power-driven fork lift attachment for their "Moto-Bug" has been developed by the Kwik-Mix Company, Port Washington, Wis.

The fork lift fits on the front of the Moto-Bug and has a 1000-lb. load capac-



ity at 15-in. load center. A power-driven hydraulic pump lifts the forks through a hydraulic ram. This attachment is interchangeable with other front attachments for the machine, which include a flatbed platform, a 10-cu. ft. capacity hopper, or a 5-ft. scraper blade.

Arthur B. Summers, 57, sales engineer for Dewey and Almy Chemical Company, died unexpectedly on May 16.

Mr Summers handled sales for the company's Construction Specialties Division in states along the Eastern Seaboard.

Hercules Steel Products Corporation, Galion, Ohio, has signed an agreement to manufacture the complete Willard line of portable concrete-handling equipment for distribution in all states bordering on and east of the Mississippi River. Willard equipment is made by the Willard Concrete Machinery Company, Ltd., Lynwood, Calif.

Walter R. Wakefield has joined the A. C. Horn Company as a field sales supervisor. He will specialize in floor finishes. He was formerly manager of industrial products sales for two firms in the floor maintenance field.

Fleming Manufacturing Company, 4985 Fyler Ave., St. Louis 9, Mo., recently moved its sales office and production plant to Cuba, Mo., The executive office will remain in St. Louis.

The new plant is comprised of four buildings of one-story construction, covering approximately 20,000 sq. ft. Tilden A. Donihee will be plant manager in addition to his other duties as sales manager and secretary. Assisting him will be Arthur Cleary, shop superintendent, and Omar Jaspering, chief of design.

These men will be assisted by the policy committee, comprised of T. H. Fleming, president; P. W. Schreiter Jr., vice-president; and Otis H. Manchester Jr., treasurer.

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*Koenig Coal & Supply Co. Detroit, Mich.
Middletown Sand & Gravel Co. Middletown, Ohio
Morse Sand & Gravel Co. Attleboro, Mass.
*Pine Hill Concrete Mix Corp. Buffalo, N. Y.
Ryan Builders Supplies, Ltd. Windsor, Ontario, Canada
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Superior Sand & Gravel Co. Phoenix, Ariz.

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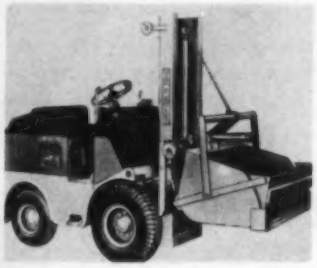
● Lift-Truck Scoop

A scoop for handling free-flowing materials such as sand and cement has been added as a standard accessory for its lift trucks by the Towmotor Corporation, Cleveland 10, Ohio.

The scoop is raised by the regular lifting mechanism of the truck and is dumped by gravity. It is available with or



without an automatic slice bar which prevents spillage of material on rough surfaces. Sizes of scoops are being made for all except the LT-90 model.

● Rear-Engine Mixer

Better load distribution and a shorter wheelbase are the advantages claimed for the new T. L. Smith rear-engine truck mixer. By moving the drum forward, more weight has been placed on the front axle; and use of the space under the

end of the drum has resulted in shortening the wheelbase. The engine and transmission for the mixer are more accessible for inspection and service.

The manufacturer, T. L. Smith Company, Milwaukee, Wis., also produces front-engine units and truck-engine-powered units.

● Rubber Concrete Spout

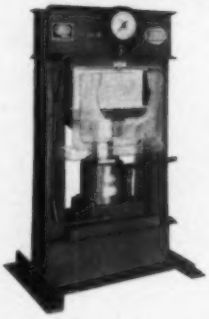
A rubber spout for handling concrete from batch mixers to trucks has been developed by the United States Rubber Company, Rockefeller Center, New York 20, N. Y.

The spout is natural rubber reinforced with fabric and is said to remain flexible. It is easily cleaned and free of clogging.

● Concrete Pigment

A green pigment for use in concrete is being released by the Filo Color and Chemical Company, 202 E. 44th St., New York 17, N. Y. The new material is said to be permanent. Other features cited are low cost, improved color, and availability, as it is made from non-critical materials.

Jones COMPRESSION TESTING MACHINE



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American Concrete Pipe Assn., 228 N. LaSalle St., Chicago, Ill.

Asphalt Institute, 801 Second Ave., N. Y. 17, N. Y.

Autoclave Building Products Assn., c/o Pacific Brick Co., Pacific, Mo.

Calcium Chloride Assn., 1028 Connecticut Ave. N. W., Washington, D. C.

Cast Stone Institute, P. O. Box 606, New Haven 3, Conn.

Cinder Concrete Products Assn., P. O. Box 95, Primos, Pa.

Concrete Reinforcing Steel Institute, 38 S. Dearborn St., Chicago, Ill.

National Assn. of Silo Manufacturers, Box 30, Norwich, N. Y.

National Cinder Concrete Products Assn., P. O. Box 95, Primos, Pa.

National Concrete Burial Vault Assn., 2553 Cummings St., Cincinnati, O.

National Concrete Masonry Assn., 38 S. Dearborn St., Chicago 3, Ill.

National Ready Mixed Concrete Assn., 1328 "E" St. N. W., Washington 4, D. C.

Perlite Institute, 35 West 53rd St., New York 19, N. Y.

Portland Cement Assn., 33 W. Grand Ave., Chicago 10, Ill.

Truck Mixer Manufacturers Bureau, Washington, D. C.

Vermiculite Institute, 208 S. LaSalle St., Chicago, Ill.

ADMIXTURES

American Bitumuls Co., 200 Bush St., San Francisco 4, Calif.

American Fluresit Co., Inc., 4011 Red Bank Rd., Cincinnati 27, Ohio.

Anti-Hydro Waterproofing Co., 365 Badger Ave., Newark 8, N. J.

Atlantic Chemicals, Inc., P. O. Box 3466, Orlando, Fla.

Autolene Lubricants Co., 1331 W. Evans Ave., Denver 9, Colo.

Brikcrete Associates, Inc., Grand Rapids 8, Mich.

Calcium Chloride Assn., 909 Ring Bldg., Washington 6, D. C.

Ceresit Waterproofing Corp., 512 S. Canal St., Chicago 7, Ill.

Colorcrete Industries, Inc., 510 Ottawa Ave., Holland, Mich.

Dewey & Almy Chemical Co., Cambridge 40, Mass.

Dow Chemical Co., Midland, Mich.

W. E. Dunn Mfg. Co., Holland, Mich.

Hercules Powder Co., 946 King St., Delaware Trust Bldg., Wilmington, Del.

Hopper Products, 12 E. 41st St., New York, N. Y.

A. C. Horn Co., 43-46 10th St., Long Island City 1, N. Y.

Hydrozo Products, Inc., 3230 University Ave., Madison 5, Wis.

Masonry Concentrates, Inc., Holland, Mich.

Masters Builders Co., 7016 Euclid Ave., Cleveland, Ohio.

Oronite Chemical Company, 38 Sansome St., San Francisco, Calif.

Pittsburgh Plate Glass Co., Columbia Chemical Div., 5th Ave. at Belleford, Pittsburgh 13, Penna.

Quigley Co., Inc., 527-5th Ave., New York 17, N. Y.

Reardon Industries, 2837 Stanton Ave., Cincinnati 6, Ohio.

Sika Chemical Corp., 35 Gregory Ave., Passaic, N. J.

Solvay Sales Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.

L. Sonneborn Sons, Inc., 88 Lexington Ave., New York 16, N. Y.

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Stonhard Company, 1306 Spring Garden St., Philadelphia 23, Pa.

Sullivan Company, 212 E. Trigg Ave., Memphis 2, Tenn.

Tamms Industries, Inc., 228 N. LaSalle St., Chicago 1, Ill.

Truscon Laboratories, Inc., 1640 Caniff Ave., Detroit 11, Mich.

Wyandotte Chemicals Corp., Michigan Alkali Div., Wyandotte, Mich.

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The Carter-Waters Corp., 2440 Pennway, Kansas City 8, Mo.

Celotex Corp., 120 S. LaSalle St., Chicago 3, Ill.

Granulite Co., 605 W. Washington St., Chicago 6, Ill.

Great Lakes Carbon Corp., 18 East 48th St., New York 17, N. Y.

Greenville Mfg. Works, Greenville, Ohio.

The Marietta Concrete Corp., Westview, Box 356, Marietta, Ohio.

Poston Brick & Concrete Products Co., Springfield, Ill.

Pumice Aggregate Sales Corp., 121 S. Yale Ave., Albuquerque, New Mex.

Pumice Engineering Co., Bend, Oregon.

Quigley Company, Inc., 527 Fifth Ave., New York 17, N. Y.

Schandler and Co., Inc., Joliet, Illinois.

The Waylite Company, 105 W. Madison St., Chicago 2, Ill.

Zonolite Company, 135 So. LaSalle St., Chicago 3, Ill.

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Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

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Chicago Pneumatic Tool Co., 6 E. 44th St., New York 17, N. Y.

Curtis Pneumatic Machy. Div., Curtis Mfg. Co., 1905 Kienlon Ave., St. Louis 20, Mo.

Davey Compressor Co., Kent, Ohio.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

The DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio.

Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

Fuller Company, Fuller Bldg., Catasauqua, Penna.

Gardner-Denver Co., Quincy, Ill.

Hobart Bros. Co., Hobart Sq., Troy 1, Ohio.

Independent Pneumatic Tool, Aurora, Ill.

Ingersoll-Rand Co., 11 Broadway, New York 5, New York.

Jaeger Machine Co., 530 Dublin Ave., Columbus 11, Ohio.

Joy Mfg. Co., Div. 24, Henry W. Oliver Bldg., Pittsburgh 22, Penna.

Kadco Corp., 36-40 11th St., Long Island City, N. Y.

Le Roi Co., 1706 S. 68th St., Milwaukee 14, Wis.

Lynch Corp., 2600 Summit St., Toledo 1, Ohio.

Nordberg Mfg. Co., 3073 S. Chase Ave., Milwaukee, Wis.

Novo Engine Co., 702 Porter St., Lansing, Mich.

O. K. Clutch & Machy. Co., 619 Florence St., Columbia, Pa.

Gene Olsen Corp., 401 Grace St., Adrian, Mich.

Quincy Compressor Co., 217 Main St., Quincy, Ill.

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Smith Machine Sales Co., 505-5th Ave., New York, N. Y.

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Hercules Steel Products Corp., Sherman St., Galion, Ohio.

Iowa Mfg. Co., Cedar Rapids, Iowa.

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Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.

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R. & J. Dick Co., Inc., P. O. Box 388, Passaic, N. J.

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L. H. Gilmer Co., Tacony, Philadelphia 35, Pa.

Goodall Rubber Co., 5 S. 36th St., Philadelphia, Penna.

B. F. Goodrich Rubber Co., Akron, Ohio.

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Beaumont-Birch Co., 1505 Race St., Philadelphia, Pa.

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Chain Belt Co., 1600 W. Bruce St., Milwaukee, Wis.

Geo. E. Christopher & Son Iron Works, 1220 Blaine, Wichita 1, Kans.

Construction Machy. Co., P. O. Box 358, Waterloo, Iowa.

Quinn Wire & Iron Works, E. 12th St., Boone, Iowa.

Joseph T. Ryerson & Son, 2558 W. 16th St., Chicago, Ill.

San Angelo Foundry & Machine Co., 1000 E. Upton St., San Angelo, Texas.

Sherman Concrete Pipe Machinery, Inc., P. O. Box 3034, Knoxville, Tenn.

Wallace Supplies Mfg. Co., 1302-4 Diversey Parkway, Chicago 14, Ill.

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Beaumont-Birch Co., 1505 Race St., Philadelphia, Penna.

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Brady Conveyors Corp., 20-A W. Jackson Blvd., Great Northern Bldg., Chicago, Ill.

Butler Bin Co., Waukesha, Wis.

Chain Belt Co., 1600 W. Bruce St., Milwaukee, Wis.

Geo. E. Christopher & Son Iron Works, 1220 Blaine, Wichita 1, Kans.

Construction Machy. Co., P. O. Box 358, Waterloo, Ia.

Continental Gin Co., Industrial Division, P. O. Box 3614, Birmingham 2, Ala.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Denver Equipment Co., P. O. Box 5268, Denver 17, Colo.

The J. B. Ehrsam & Sons Mfg. Co., Enterprise, Kans.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

Fleming Mfg. Co. Inc., 4935 Fyler Ave., St. Louis 9, Mo.

Fuller Company, Fuller Bldg., Catasauqua, Penna.

Gar-Bro Mfg. Co., 3416 E. 16th St., Los Angeles 21, Calif.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 16, Mo.

Greenville Mfg. Works, Greenville, Ohio.

Groch Engineering Co., Searchlight, Nevada.

Gruendler Crusher & Pulverizer Co., 2915-17th N. Market St., St. Louis, Mo.

Hardy Scale Corp., 5701 Atlantic Blvd., Los Angeles, Calif.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Robt. Holmes & Bros. Inc., 512-532 Junction Ave., Danville, Ill.

Iowa Mfg. Co., 916 N. 16th St., Cedar Rapids, Iowa.

The Jeffrey Mfg. Co., 935-99 N. 4th St., Columbus 16, Ohio.

C. S. Johnson Co., P. O. Box 71, Champaign, Ill.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Madsen Iron Works, 5631 Bickett St., Huntington Park, Calif.

Manganese Steel Forge Co., Richmond St. & Castor Ave., Philadelphia 34, Pa.

E. F. Marsh Engineering Co., 4030 Chateau Ave., St. Louis 16, Mo.

McLanahan & Stone Corp., 200 Wall St., Hollidaysburg, Pa.

Meyer Scales & Equipment Corp., 449 Central Ave., Orange, N. J.

The Mine & Smelter Supply Co., P. O. Box 5270, Terminal Sta., Denver 17, Colo.

Muller Machinery Co. Inc., Metuchen, New Jersey.

Multiplex Machinery Corp., Elmore, Ohio.

The Neff & Fry Co., Camden, Ohio.

Noble Company, 1860-7th St., Oakland 20, Calif.

Pioneer Engineering Wks., Inc., 1515 Central Ave. N. E., Minneapolis 13, Minn.

Posey Iron Works, Inc., Brick Machinery Division, Lancaster, Pa.

Richardson Scale Co., Van Houten Ave., Clifton, N. J.

Robins Conveyors, Div. Hewitt-Robins, Inc., 270 Passaic Ave., Passaic, N. J.

Rogers Iron Works Co., 11th & Pearl Sts., Joplin, Mo.

Smith Engineering Works, 504 E. Capitol Drive, Milwaukee 12, Wis.

Sprout, Waldron & Co., Inc., Muncy, Pa.

The Standard Metal Mfg. Co., Malinta, Ohio.

Stearns Mfg. Co., Inc., Adrian, Mich.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Straub Mfg. Co., Inc., 507 Chestnut St., Oakland 7, Calif.

Supremix, Inc., Adrian, Mich.

Traylor Engineering & Mfg. Co., 10th & Mill Sts., Allentown, Pa.

Universal Engineering Corp., 625 C Ave. N. W., Cedar Rapids, Ia.

Universal Road Machinery Co., Kingston, New York.

Vulcan Iron Works, 700 S. Main St., Wilkes Barre, Pa.

Webster Mfg. Inc., Tiffin, Ohio.

Willard Concrete Machy. Co., Ltd., 2906 Imperial Highway, Lynwood, Calif.

Wisconsin Foundry & Machine Co., 622 E. Main St., Madison 1, Wis.

BIN LEVEL CONTROLS AND INDICATORS

Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio.

The Bin-Dicator Co., 12946 Kercheval Ave., Detroit 15, Mich.

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Brown Instrument Co., 4444 Wayne Ave., Philadelphia 44, Pa.

Butler Bin Co., Waukesha, Wis.

Conveyor Co., Inc., 3620 E. Slauson Ave., Los Angeles 11, Calif.

Erie Steel Const. Co., 67 Geist Road, Erie, Penna.

Fairbanks Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

Fuller Company, Fuller Bldg., Catasauqua, Penna.

General Electric Co., 1 River Rd., Schenectady 5, N. Y.

Hardy Scale Corp., 5701 Atlantic Blvd., Los Angeles, Calif.

The Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Holly Pneumatic Systems, Inc., 15 E. 40th St., New York, N. Y.

Jeffrey Mfg. Co., 935-99 N. 4th St., Columbus 16, Ohio.

C. S. Johnson Co., P. O. Box 71, Champaign, Ill.

Kennedy-Van Saun Mfg. & Engineering Corp., 2 Park Ave., New York 16, N. Y.

Noble Company, 1860-7th St., Oakland 20, Calif.

F. L. Smidth & Co., 11 W. 42nd St., New York 17, N. Y.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Syntron Co., Homer City, Pa.

BIN VALVES

Beaumont-Birch Co., 1505 Race St., Philadelphia, Penna.

Blaw-Knox Co., Farmer Bank Bldg., Pittsburgh 22, Pa.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Brady Conveyors Corp., 20-A W. Jackson Blvd., Great Northern Bldg., Chicago, Ill.

Butler Bin Co., Waukesha, Wis.

Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis.

Cleveland Vibrator Co., 2828 Clinton Ave. W., Cleveland, Ohio.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

Fuller Company, Fuller Bldg., Catasauqua, Penna.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 16, Mo.

Hardy Scale Corp., 5701 Atlantic Blvd., Los Angeles, Calif.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Robt. Holmes & Bros. Inc., 510-522 Junction Ave., Danville, Ill.

The Jeffrey Mfg. Co., 935-99 N. 4th St., Columbus 16, Ohio.

C. S. Johnson Co., P. O. Box 71, Champaign, Ill.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Multiplex Machinery Corp., Elmore, Ohio.

Noble Co., 1960-7th St., Oakland 7, Calif.

The W. W. Sly Mfg. Co., 4700 Train Ave., Cleveland 2, Ohio.

Stephens-Adamson Mfg. Co., 7 Ridgeway Ave., Aurora, Ill.

Sprout, Waldron & Co. Inc., Muncy, Pa.

Syntron Co., Homer City, Pa.

Webster Mfg. Inc., Tiffin, Ohio.

BINS & HOPPERS

Alpha Tank & Sheet Metal Mfg. Co., 5007 S. 35th St., St. Louis 16, Mo.

Austin-Western Co., 601 Farnsworth Ave., Aurora, Ill.

Barber-Greene Co., Aurora, Illinois.

Besser Mfg. Co., Alpena, Mich.

Bethlehem Steel Co., 701 E. 3rd St., Bethlehem, Penna.

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Bodinson Mfg. Co., 3401 Bayshore Blvd., San Francisco 24, Calif.

Bonded Scale Co., 41 Bellview, Columbus 7, Ohio.

Butler Bin Co., Waukesha, Wis.

L. Burmeister Co., 4535 W. Mitchell St., Milwaukee 14, Wis.

Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

Construction Machy. Co., P. O. Box 358, Waterloo, Iowa.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Dodson Mfg. Co. Inc., 1463 Barwise, Wichita, Kan.

Dravo Corp., Neville Island, Pittsburgh 25, Pa.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

The J. B. Ehrsam & Sons Mfg. Co., Enterprise, Kan.

Fleming Mfg. Co. Inc., 4985 Fyler Ave., St. Louis 9, Mo.

Gar-Bro Mfg. Co., 2416 E. 16th St., Los Angeles 21, Calif.

General Engines Co., 307 Hunter St., Gloucester, N. J.

Greenville Mfg. Works, Greenville, Ohio.

Hardy Scale Corp., 5701 Atlantic Blvd., Los Angeles, Calif.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Robt. Holmes & Bros. Inc., 512-522 Junction Ave., Danville, Ill.

Iowa Mfg. Co., 918 N. 16th St., Cedar Rapids, Iowa.

Jaeger Machine Co., 550 W. Spring St., Columbus 16, Ohio.

The Jeffrey Mfg. Co., 935 N. 4th St., Columbus 16, Ohio.

C. S. Johnson, P. O. Box 71, Champaign, Ill.

Kirk & Blum Mfg. Co., 2838 Spring Grove Ave., Cincinnati 25, Ohio.

Kron Div. of Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia, Pa.

Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Lippert Co., L. K., 212-1st St., London, Ohio.

Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.

Littleford Bros., Inc., 453 E. Pearl St., Cincinnati 2, Ohio.

Madsen Iron Works, 5631 Bickett St., Huntington Park, Calif.

Marietta Concrete Corp., Marietta, Ohio.

McDermott Bros. Co., Washington St., Allentown, Penna.

Meyer Scales & Equipment Corp., 449 Central Ave., Orange, N. J.

Multiplex Machinery Corp., Elmore, Ohio.

The Neff & Fry Co., Camden, Ohio.

The Nicholson Co., 10 Rockefeller Plaza, New York 20, N. Y.

Noble Company, 1960-7th St., Oakland 20, Calif.

Posey Iron Works, Inc., Brick Machinery Division, Lancaster, Pa.

Richardson Scale Co., Van Houten Ave., Clifton, N. J.

Sakrete Inc., Fischer Ave. & B. & O. RR., St. Bernard, Cincinnati, Ohio.

Scientific Concrete Service Corp., 724 Salem Ave., Elizabeth, N. J.

Simplicity System Co., Riverside Dr., Chattanooga 6, Tenn.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Supremix, Inc., Adrian, Mich.

Universal Engineering Corp., 625 C Ave. N. W., Cedar Rapids, Iowa.

Willard Concrete Machy. Co. Ltd., 2906 Imperial Highway, Lynwood, Calif.

Winslow Scale Co., 25th & Haythorne Ave., Terre Haute, Ind.

Wisconsin Foundry & Machine Co., 623 E. Main St., Madison 1, Wis.

Wittemann Machy. Co., Farmingdale, N. J.

BLADES, MASONRY SAW

Champion Mfg. Co., 2028 Washington, St. Louis 3, Mo.

Clipper Mfg. Co., 2801 Warwick, Kansas City, Mo.

Lee Sales Co., 10439 San Carlos, South Gate, Calif.

Stone Machy. Inc., 1714 N. Salina St., Syracuse, N. Y.

Victor Engineering Corp., 27 Maplewood Ave., Philadelphia 44, Pa.

BLOCK MACHINES

Allied Welding & Mfg. Co., 49 Lorna Doone Blvd., Orlando, Fla.

Anchor Concrete Machinery Co., 1191 Fairview Ave., Columbus 12, Ohio.

J. W. Appley & Son Inc., 831 9th St. N., St. Petersburg 2, Fla.

Brikcrete Associates, Inc., 4651 S. Division Ave., Grand Rapids, Mich.

Besser Mfg. Co., 106-36th St., Alpena, Mich.

Brodersen Industries, 2865 Riverside Dr., Los Angeles 39, Cal.

Geo. E. Christopher & Son Iron Works, 1220 Blaine, Wichita 1, Kan.

Columbia Machine Works, 107 South Grand, Vancouver, Wash.

Concrete Equipment Co., 530 Ottawa Ave., Holland, Mich.

Concrete Machinery Co., Hickory, N. C.

Concrete Pipe Machy. Co., 111 George St., Sioux City, Iowa.

Crawford Industries, 1100 East Second St., Pomona, Calif.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

Des Plaines Concrete Prod. Machy. Co., 930 North Ave., Des Plaines, Ill.

W. E. Dunn Mfg. Co., Holland, Mich.

Economy Mfg. Co., Stone Mountain, Ga.

Fleming Mfg. Co. Inc., 4985 Fyler Ave., St. Louis 9, Mo.

Ford Cement Block Co., Cedar Falls, Iowa.

F. C. George Machine Co., 100 S. Westmoreland Dr., Orlando, Fla.

General Engines Co., Inc., 307 Hunter St., Gloucester, N. J.

Hydro-Forged Stone Associates, Inc., 434 Bulkley Bldg., Cleveland, Ohio.

The Kent Machine Co., Cuyahoga Falls, Ohio.

Lifetime Building Specialties, Inc., 519 Brook Haven Dr., Orlando, Fla.

Lith-I-Bar Co., Holland, Mich.

Magic-Concrete Eqpt. Co., 13 Woodland Ave., Winsted, Conn.

Masonry Equipment & Engineering Co., 325 E. Michigan Ave., Three Rivers, Mich.

Miles Manufacturing Co., Jackson, Mich.

Leslie C. Miller Supply Inc., Bedford, Ohio.

Mishco Corporation, 615 S. W. 2nd Ave., Miami, Fla.

Mortarless Machine Corp., 2623 Riverside Drive, Los Angeles, Calif.

Multiplex Machinery Corp., Elmore, Ohio.

D. J. Murray Mfg. Co., Wausau, Wis.

Norris Self-O-Line Block Co., 4 S. 15th St., Philadelphia, Pa.

Gene Olsen Corp., 401 Grace St., Adrian Mich.

Oswalt Engineering Service Corp. Engineering Service), 1335 Circle Ave., Forest Park, Ill.

Petersburg Concrete & Nickelson Supply Co., 2237 E. Bank St., Petersburg, Va.

Posey Iron Works, Inc., Brick Machinery Division, Lancaster, Pa.

Praschak Machine Co., Marshfield, Wis.

Smith Machine Sales Co., 505-5th Ave., New York, New York.

Stearns Mfg. Co. Inc., Adrian, Mich.

Superior-Lidgerwood-Mundy Corp., Superior, Wis.

Twinplex Hydraulics, Inc., 2507 James St., Syracuse 6, N. Y.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Universal Tampers, Inc., 1530 N. Adams St., Peoria, Ill.

Vibra-Tamp Mach. Co., 803 McCormick St., Greensboro, N. C.

Wittemann Machinery Co., Farmingdale, N. J.

C. M. Wooten Co., 2717 N. Central Ave., Knoxville 17, Tenn.

SPECIAL FACING FOR CONCRETE BLOCK

Knighton Franchise Distributing Co., 3053 Highland Ave., Birmingham, Ala.

Mingotile, Inc., 4418 First Ave. North, Birmingham, Ala.

BOILERS

Babcock & Wilcox Co., 85 Liberty St., New York 6, N. Y.

Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee, Wis.

Combustion Engineering-Superheater, Inc., 1321 N. Branch St., Chicago 22, Illinois.

Consolidated Boiler Corp., 126 Dartmouth St., Boston 16, Mass.

Cyclotherm Corp., 157 E. 157th St., Oswego, New York.

The Derr Co., 570 Lexington Ave., New York 22, N. Y.

Kewanee Boiler Corp., Kewanee, Ill.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Littleford Bros., Inc., 453 E. Pearl St., Cincinnati 2, Ohio.

McDermott Bros. Co., Washington St., Allentown, Pa.

Manitowoc Engrg. Wks., Manitowoc, Wis.

Siebring Mfg. Co., George, Iowa.

Straub Mfg. Co., 507 Chestnut, Oakland, 7, Calif.

The Wickes Boiler Co., 515 W. Washington Ave., Saginaw, Mich.

William Bros. Boiler & Mfg. Co., 1057-10th Ave., S. E. Minneapolis 14, Minn.

BRICK MACHINES

Appley & Son, J. W., P. O. Box 849, Station A, St. Petersburg, Fla.

Besser Mfg. Co., Alpena, Mich.

Brikcrete Associates Inc., 4651 S. Division Ave., Grand Rapids, Mich.

W. E. Dunn Mfg. Co., Holland, Mich.

General Engines Co., Inc., 307 Hunter St., Gloucester, N. J.

Jackson & Church Co., 321 N. Hamilton St., Saginaw, Mich.

Posey Iron Works Inc., Brick Machy. Div., Lancaster, Pa.

BUCKET LOADERS

Austin-Western Co., 401 Farnsworth Ave., Aurora, Ill.

Barber-Greene Co., 631 W. Park Ave., Aurora, Ill.

Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis.

Conveyor Engineering & Supplies Corp., Hobart Pl. & D. L. W. R. R., Clifton, N. J.

Eagle Crusher Co., Galion, Ohio.

Elmco Corporation, P. O. Box 300, Salt Lake City 8, Utah.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 15, Mo.

George Haiss Mfg. Co. Inc., Div. of Pettibone Mulliken Corp., 331 Canal Place, New York, N. Y.

The Frank G. Hough Co., E. Sunnyside Ave., Libertyville, Ill.

Hyster Co., 2926 N. E. Clackamas St., Portland 8, Ore.

The Jeffrey Mfg. Co., 938-99 N. 4th St., Columbus 16, Ohio.

Kent Machine Co., Cuyahoga Falls, Ohio.

Lessmann Mfg. Co., P. O. Box 873, Des moines 4, Iowa.

Link-Belt Co., 300 W. Pershing Road., Chicago 9, Ill.

Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.

Lull Mfg. Co., 2612 E. 44th St., Minneapolis 6, Minn.

N. P. Nelson Iron Wks., Inc., 320 Bloomfield Ave., Clifton, N. J.

Ottawa Steel Products, Inc., 1st & Walnut, Ottawa, Kan.

Pettibone-Mulliken Corp., 4710 W. Division St., Chicago 51, Ill.

Trackson Company, Milwaukee 1, Wis.

Triangle Engineering Co., 2343 W. 26th St., Chicago 23, Ill.

Trowbridge Conveyor Co., 350 Van Houten Ave., Clifton, N. J.

Truk-Loder Co., 45 Grace St., Tiffin, Ohio.

Western Machy. Co., 760-766 Folsom St., San Francisco 7, Calif.

Willard Concrete Machy. Co. Ltd., 2906 Imperial Highway, Lynwood, Calif.

BUCKETS, CONCRETE

Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland 10, Ohio.

Blaw-Knox, Div. of Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Construction Machy. Co., P. O. Box 358, Waterloo, Iowa.

Conveyor Engineering & Supplies Corp., Hobart Pl. & D. L. W. R. R., Clifton, N. J.

Drave Corporation, Neville Island, Pittsburgh, Penna.

Gar-Bro Mfg. Co., 2416 E. 16th St., Los Angeles 21, Calif.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

C. S. Johnson, P. O. Box 71, Champaign, Ill.

Muller Machinery Co., Inc., Metuchen, New Jersey.

Multiplex Machinery Corp., Elmore, Ohio.

Noble Company, 1360-7th St., Oakland 20, Calif.

Superior-Lidgerwood-Mundy Corp., Superior, Wis.

BUCKETS, ELEVATOR

Alpha Tank & Sheet Metal Mfg. Co., 5007 S. 38th St., St. Louis 16, Mo.

Anchor Concrete Machinery Co., 1191 Fairview Ave., Columbus 12, Ohio.

Austin-Western Co., 401 Farnsworth Ave., Aurora, Ill.

Beaumont-Birch Co., 1505 Race St., Philadelphia, Penna.

Barber-Greene Co., 631 W. Park Ave., Aurora, Ill.

Baughman Mfg. Co., Jerseyville, Ill.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Chain Belt Co., 1600 Bruce St., Milwaukee, Wis.

Chicago Steel Foundry Co., Kedzie Ave., & 37th St., Chicago 32, Ill.

The Columbus Conveyor Co., 869 W. Goodale St., Columbus, Ohio.

Continental Gin Co., Industrial Division, P. O. Box 2614, Birmingham 2, Ala.

The Conveyor Co., 2360 E. Slauson Ave., Los Angeles 58, Calif.

Conveyor Engineering & Supplies Corp., Hobart Pl. & D. L. W. R. R., Clifton, N. J.

Coyle & Roth, 3024 S. E. 4th St., Minneapolis 14, Minn.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

Denver Equipment Co., 1400-17th St., Denver, Colo.

Diamond Iron Works, Inc., 1728 N. 2nd St., Minneapolis 11, Minn.

Eagle Crusher Co., Galion, Ohio.

Erie Steel Const. Co., 67 Goist Rd., Erie, Penna.

J. B. Ehrsam & Sons Co., Enterprise, Kansas.

The Elmco Corp., P. O. Box 300, Salt Lake City 8, Utah.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

Fleming Mfg. Co., Inc., 4935 Fyler Ave., St. Louis 9, Mo.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 15, Mo.

Greenville Mfg. Works, Greenville, Ohio.

Gruendler Crusher & Pulverizer Co., 2915-17 N. Market St., St. Louis, Mo.

George Haiss Mfg. Co., Div. of Pettibone Mulliken Corp., Park Ave. & 143rd St., New York 51, N. Y.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Iowa Mfg. Co., 916 N. 16th St., Cedar Rapids, Iowa.

Jeffrey Mfg. Co., Columbus 16, Ohio.

C. S. Johnson, P. O. Box 71, Champaign, Ill.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Kent Machine Co., Cuyahoga Falls, Ohio.

Frank A. Kremser & Sons, Inc., 3435 W. 5th Street, Philadelphia 40, Pa.

Link-Belt Co., 300 W. Pershing Road, Chicago 9, Ill.

Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.

McLanahan & Stone Corp., 200 Wall St., Hollidaysburg, Pa.

Mosher Electronic Controls, 130 W. 42nd St., New York 18, New York.

Multiplex Machinery Corp., Elmore, Ohio.

National Malleable & Steel Castings Co., 19600 Quincy Ave., Cleveland, Ohio.

N. P. Nelson Iron Works, Inc., 320 Bloomfield Ave., Clifton, N. Y.

Noble Company, 1360-7th St., Oakland 20, Calif.

Northern Conveyor Co., Janesville, Wis.

Pettibone-Mulliken Corp., 4710 W. Division St., Chicago 51, Ill.

Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.

Praschak Machine Co., Marshfield, Wis.

Robins Conveyors, Div. Hewitt-Robins Inc., 270 Passaic Ave., Passaic, N. J.

Rogers Iron Works Co., 10th & Pearl Sts., Joplin, Mo.

Smith Engineering Works, 533 E. Capitol Dr., Milwaukee 12, Wis.

Sprout, Waldron & Co. Inc., Muncy, Pa.

Standard Metal Mfg. Co., Malinta, Ohio.

Stephens-Adamson Mfg. Co., Aurora, Ill.

CLASSIFIED DIRECTORY

Sturtevant Mill Co., Harrison St., Boston 23, Mass.

Supremix, Inc., Adrian, Mich.

Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

Traylor Engineering & Mfg. Co., 10th & Mill St., Allentown, Pa.

Triangle Engineering, 2948 W. 26th St., Chicago, Ill.

Trowbridge Conveyor Co., 850 Van Houten Ave., Clifton, N. J.

Universal Engineering Corp., 625 "C" Ave. N. W., Cedar Rapids, Iowa.

Universal Road Machinery Co., Kingston, New York.

Webster Mfg. Inc., Tiffin, Ohio.

Western Machinery Co., 760 Folsom St., San Francisco, Calif.

Wisconsin Foundry & Machine Co., 623 E. Main St., Madison 1, Wis.

Wittemann Machinery Co., Farmingdale, N. J.

BULK CEMENT HANDLING EQUIPMENT

Atlas Conveyor Co., Box 59-B, Clintonville, Wis.

The C. O. Bartlett & Snow Co., 6200 Harvard Ave., Cleveland 5, Ohio.

Beaumont-Birch Co., 1505 Race St., Philadelphia, Penna.

Blaw-Knox, Co., Farmers Bank Bldg., Pittsburg 22, Penna.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Bonded Scale Co., 2166 S. 3rd St., Columbus, Ohio.

Brady Conveyors Corp., 20-A W. Jackson Blvd., Great Northern Bldg., Chicago, Ill.

Butler Bin Co., Waukesha, Wis.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

Continental Gin Co., Industrial Division, P. O. Box 2614, Birmingham 2, Ala.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Cook Bros. Equipment Co., 1815 N. Broadway, Los Angeles, Calif.

Dravo Corporation, Neville Island, Pittsburgh, Penna.

The J. B. Ehrsam & Sons Mfg. Co., Enterprise, Kan.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

Fleming Mfg. Co., Inc., 4985 Fyler Ave., St. Louis 9, Mo.

Fuller Company, Fuller Bldg., Catasauqua, Penna.

Gar-Bro Mfg. Co., 2416 E. 16th St., Los Angeles 21, Calif.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 18, Mo.

Hardinge Co., Inc., 240 Arch St., York, Penna.

Hardy Scale Corp., 5701 Atlantic Blvd., Los Angeles, Calif.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Holly Pneumatic Systems, Inc., 15 E. 40th St., New York, N. Y.

The Frank G. Hough Co., E. Sunnyside Ave., Libertyville, Ill.

Howe Scale Co., 3-13 Scale Ave., Rutland, Vt.

Jeffrey Mfg. Co., 935-99 N. 4th St., Columbus 16, Ohio.

C. S. Johnson Co., P. O. Box 71, Champaign, Ill.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Kent Machine Co., Cuyahoga Falls, Ohio.

Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Lippmann Engineering Works, 4603 W. Mitchell, Milwaukee 14, Wis.

Madsen Iron Works, 5621 Bickett St., Huntington Park, Calif.

Market Forge Co., Materials Handling Div., 77 Gravey St., Everett 49, Mass.

Meyer Scales & Equipment Corp., 449 Central Ave., Orange, N. J.

Multiplex Machinery Corp., Elmore, Ohio.

Noble Company, 1860—7th St., Oakland 20, Calif.

Pioneer Engineering Wks., Inc., 1515 Central Ave. N. E., Minneapolis 13, Minn.

Richardson Scale Co., Van Houten Ave., Clifton, N. J.

Robins Conveyors Div., Hewitt-Robins, Inc., 270 Passaic Ave., Passaic, N. J.

Robinson Air Activated Conveyor Systems, Div. of Morse Boulger Destructor Co., 211-G East 42nd St., New York 17, N. Y.

Silent Hoist & Crane Co., Inc., 841-65 63rd St., Brooklyn 20, N. Y.

Sprout, Waldron & Co., Inc., Muncy, Pa.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Supremix, Inc., Adrian, Mich.

Syntron Co., 385 Carson, Homer City, Pa.

Trowbridge Conveyor Co., 850 Van Houten Ave., Clifton, N. J.

Webster Mfg., Inc., Tiffin, Ohio.

BULK CEMENT STORAGE PLANTS

Alpha Tank & Sheet Metal Mfg. Co., 5007 S. 38th St., St. Louis 16, Mo.

Beaumont-Birch Co., 1505 Race St., Philadelphia, Penna.

Bethlehem Steel Co., 701 E. 3rd St., Bethlehem, Penna.

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Bonded Scale Co., 2166 S. 3rd St., Columbus, Ohio.

Butler Bin Co., Waukesha, Wis.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

Fleming Mfg. Co., Inc., 4985 Fyler Ave., St. Louis 9, Mo.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 18, Mo.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

C. S. Johnson Co., P. O. Box 71, Champaign, Ill.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Madsen Iron Works, 5621 Bickett St., Huntington Park, Calif.

Multiplex Machinery Corp., Elmore, Ohio.

The Neff & Fry Co., Camden, Ohio.

The Nicholson Co., 10 Rockefeller Plaza, New York 20, N. Y.

Noble Company, 1860-7th St., Oakland 20, Calif.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Supremix, Inc., Adrian, Mich.

BULK CEMENT TRUCKS

Baughman Mfg. Co., Jerseyville, Ill.

Fruehauf Trailer Co., Detroit, Mich.

Gramm Trailer Corp., Delphos, Ohio.

Highway Trailer Company, Edgerton, Wisc.

CAR PULLERS

American Hoist & Derrick Co., 63 S. Robert St., St. Paul 1, Minn.

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland 10, Ohio.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Clyde Iron Works, Inc., 29th Ave. W. & Michigan St., Duluth 1, Minn.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

Dobbie Foundry & Machine Co., 146-170 Portage Rd., Niagara Falls, New York.

The J. B. Ehrsam & Sons Mfg. Co., Enterprise, Kan.

Robt. Holmes & Bros., Inc., 512-522 Junction Ave., Danville, Ill.

The Jeffrey Mfg. Co., Columbus, 16, Ohio.

W. A. Jones Foundry & Machinery Co., 4401 Roosevelt Rd., Chicago 24, Ill.

Joy Mfg. Co., Dept. 34, Henry W. Oliver Bldg., Pittsburgh 22, Penna.

Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Silent Hoist & Crane Co., Inc., 841-65 63rd St., Brooklyn 20, N. Y.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Superior-Lidgerwood-Mundy Corp., Superior, Wis.

Webster Mfg., Inc., Tiffin, Ohio.

CARS, CONCRETE PRODUCTS

American Car Foundry Co., 30 Church St., New York 8, N. Y.

Anchor Concrete Machinery Co., 1191 Fairview Ave., Columbus 12, Ohio.

Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland 10, Ohio.

Austin-Western Co., 401 Farnsworth Ave., Aurora, Ill.

Chase Fdry. & Mfg. Co., 2300 Parsons Ave., Columbus 7, Ohio.

W. E. Dunn Mfg. Co., 23 W. 24th St., Holland, Mich.

Easton Car & Construction Co., Easton, Penna.

Pressed Steel Car Co., Inc., 2500 Koppers Bldg., Pittsburgh 30, Pa.

H. K. Porter Co., Inc., Oliver Bldg., Pittsburgh 22, Pa.

Sullivan Company, 212 E. Trigg Ave. Memphis 2, Tenn.

CLASSIFIED DIRECTORY

CAR SHAKERS

Cannon Vibrator Co., 1111 Power Ave., Cleveland, Ohio.

National Conveyor & Supply Co., 350 N. Harding Ave., Chicago 24, Ill.

New Haven Vibrator Co., 160 Chestnut St., New Haven 7, Conn.

Syntron Co., Homer City, Penna.

The Cleveland Vibrator Co., 2828 Clinton Ave. W., Cleveland, Ohio.

CASTINGS (ABRASIVE) Nickel

Brom Foundry & Machine Co., Winona, Minn.

Farrell-Cheek Steel Co., Sandusky, Ohio.

*International Nickel Co., Inc., 67 Wall St., New York 5, N. Y.
*With Authorized Foundries—Coast to Coast

CEMENT, AIR ENTRAINING

Lehigh Portland Cement Co., 718 Hamilton St., Allentown, Penn.

Lone Star Cement Corp., 100 Park Ave., New York 17, N. Y.

Marquette Cement Mfg. Co., 20 N. Wacker Drive, Chicago 6, Ill.

Medusa Portland Cement Co., 1000 Midland Bldg., Cleveland 15, Ohio.

Pennsylvania-Dixie Cement Corp., 60 E. 42nd St., New York 17, N. Y.

Trinity Division, General Portland Cement Co., 1618 Republic Bank Bldg., Dallas 1, Texas.

Universal-Atlas Cement Co., 135 E. 42nd St., New York 17, N. Y.

CINDER GRINDERS

W. A. Riddell Corp., Bucyrus, Ohio.

CINDERS, PROCESSED

Foreston Coal Company, Inc., 500 Fifth Ave., New York, N. Y.

Cinder Shippers (Formerly H. Hessey Miller), Chester, Pa.

CLAMPS, FORM

Adjustable Clamp Co., 417 N. Ashland Ave., Chicago 22, Ill.

Star Expansion Products Co., 147-149 Cedar St., New York 6, N. Y.

Symons Clamp & Mfg. Co., 4249 Diversey Ave., Chicago 39, Ill.

Universal Concrete Pipe Co., Inc., 397 South High St., Columbus, Ohio.

Williams Form Engrg. Corp., Box 924, Madison Sq. Sta., Grand Rapids, Mich.

COLORS, CEMENT AND MORTAR

Blue Ridge Talc Co., Henry, Va.

The Burns & Russell Co., 403 Tower Bldg., Baltimore 2, Md.

Ceresit Waterproofing Corp., 512 S. Canal St., Chicago 7, Ill.

Filo Color & Chemical Corp., 202 E. 44th St., New York 17, N. Y.

Landers-Segal Color Co., 78 Delavan St., Brooklyn 31, N. Y.

Lasting Products Co., 200 S. Franklintown Rd., Baltimore 23, Md.

Master Builders Co., 7016 Euclid Ave., Cleveland, Ohio.

Mineral Pigments Corp., Muirkirk, Md.

Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul 6, Minn.

Penn Crete Products Co., 20th & Lippincott Sts., Philadelphia 32, Pa.

Reardon Industries, Inc., 2837 Stanton Ave., Cincinnati 6, Ohio.

Reichard-Coulston, Inc., 15 E. 26th St., New York 10, N. Y.

Ricketson Mineral Color Works, 229 E. Wisconsin Ave., Milwaukee, Wis.

Smith Chemical & Color Co., 55 John St., Brooklyn, N. Y.

J. Lee Smith & Co., Inc., 25 Ann St., New York 7, New York.

L. Sonneborn Sons, Inc., 88 Lexington Ave., New York 16, N. Y.

Sparkle-Crete Co., 30 N. LaSalle St., Chicago 2, Ill.

Sullivan Company, 212 E. Trigg Ave., Memphis 2, Tenn.

Tamms Industries, Inc., 228 N. LaSalle St., Chicago 1, Ill.

C. K. Williams & Co., 640 N. 13th St., Easton, Penna.

CONCRETE CONTROL SYSTEMS

Automatic Liquid Meter Co., 1372-1378 E. 15th St., Los Angeles 21, Calif.

Carlyle Rubber Co., 64 Park Place, New York 7, N. Y.

Meyer Scales & Equipment Corp., 449 Central Ave., Orange, N. J.

C. S. Johnson, P. O. Box 71, Champaign, Ill.

M & M Engineering Corp., 2922 Millersville Dr., Indianapolis 5, Ind.

Neptune Meter Co., 50 West 50th St., New York 20, N. Y.

Rainhart Company, 602-3 W. 24th St., Austin 21, Texas.

Scientific Concrete Service Corp., 724 Salem Ave., Elizabeth, N. J.

CONCRETE TEST CYLINDER MOLDS

Moline Iron Works, Moline, Ill.

CONVEYORS, BELT

Allied Welding & Mfg. Co., 49 Lorna Doone Blvd., Orlando, Fla.

American Conveyor Co., 1115 W. Adams St., Chicago 7, Ill.

Atlas Conveyor Co., Box 59B, Clintonville, Wis.

Austin-Western Co., 601 Farnsworth Ave., Aurora, Ill.

Barber-Greene Co., 631 W. Park Ave., Aurora, Ill.

Beaumont-Birch Co., 1505 Race St., Philadelphia, Penna.

Bonded Scale Co., 2166 S. 3rd St., Columbus, Ohio.

Brady Conveyors Corp., 20-A W. Jackson Blvd., Great Northern Bldg., Chicago, Ill.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Chain Belt Co., 1600 Bruce St., Milwaukee, Wis.

Columbus Conveyor Co., 669 W. Goodale Blvd., Columbus 8, Ohio.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

Continental Gin Co., Industrial Div., P. O. Box 2614, Birmingham 2, Ala.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Conveyor Engineering & Supplies Corp., Hobart Pl. & D. L. & W. R.R., Clifton, N. J.

Coyle & Roth, 3024 S. E. 4th St., Minneapolis 14, Minn.

Denver Equipment Co., 1400—17th St., Denver, Colo.

Eagle Crusher Co., Galion, Ohio.

The J. B. Ehrsam & Sons Mfg. Co., Enterprise, Kansas.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

A. B. Farquhar Co., Conveyor Div., N. Duke St., York, Penna.

Fleming Mfg. Co., Inc., 4985 Fyler Ave., St. Louis 9, Mo.

Gar-Bro Mfg. Co., 2416 E. 16th St., Los Angeles 21, Calif.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 16, Mo.

General Engines Co., Inc., 307 Hunter St., Gloucester, N. J.

Goodall Rubber Co., 5 S. 36th St., Philadelphia, Pa.

Goodman Mfg. Co., 4834 S. Halsted, Chicago 9, Ill.

Greenville Mfg. Wks., Greenville, Ohio.

George Haiss Mfg. Co., Inc., Div. of Pettibone Mulliken Corp., 331 Canal Pl., New York, N. Y.

The Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Houston Concrete Machinery Co., 114 Heights Blvd., Houston 7, Texas.

Iowa Mfg. Co., 916 N. 16th St., Cedar Rapids, Iowa.

The Jeffrey Mfg. Co., Columbus 16, Ohio.

C. S. Johnson Co., P. O. Box 71, Champaign, Ill.

Joy Mfg. Company, Dept. 24, Henry W. Oliver Bldg., Pittsburgh 22, Penna.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Kent Machine Co., Cuyahoga Falls, Ohio.

Lake Shore Engineering Co., Iron Mountain, Mich.

Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Lippmann Engineering Wks., 4603 W. Mitchell St., Milwaukee 4, Wis.

The Manhattan Rubber Mfg. Co., Div. of Raybestos-Manhattan, Inc., 61 Willett St., Passaic, N. J.

E. F. Marsh Engineering Co., 4030 Chateau Ave., St. Louis 10, Mo.

McLanahan & Stone Corp., 200 Wall St., Hollidaysburg, Pa.

The McNally-Pittsburg Mfg. Corp., Pittsburg, Kansas.

Noble Company, 1860—7th St., Oakland 20, Calif.

Northern Conveyor Co., Janesville, Wis.

Pioneer Engineering Wks., Inc., 1515 Central Ave. N. E., Minneapolis 13, Minn.

Posey Iron Works, Inc., Brick Machinery Division, Lancaster, Pa.

Praschak Machine Co., Marshfield, Wis.

Republic Rubber Co., Youngstown, Ohio.

Robins Conveyors Div. Hewitt-Robins, Inc., 270 Passaic Ave., Passaic, N. J.

Rogers Iron Works Co., 10th & Pearl St., Joplin, Mo.

Smith Machine Sales Co., 505—5th Ave., New York, N. Y.

Smith Engineering Works, 532 E. Capitol Dr., Milwaukee 12, Wis.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Straub Mfg. Co., Inc., 507 Chestnut St., Oakland 7, Calif.

Sturtevant Mill Co., Harrison St., Boston 22, Mass.

Sprout, Waldron & Co., Inc., Muncy, Pa.

Transall, Inc., 109 North 11th St., Birmingham, Alabama.

Trowbridge Conveyor Co., 850 Van Houten Ave., Clifton, N. J.

Universal Engineering Corp., 625 "C" Ave. N.W., Cedar Rapids, Iowa.

Webster Mfg. Inc., Tiffin, Ohio.

West Bend Equipment Co., West Bend, Wis.

Willard Concrete Machy., Ltd., 2906 Imperial Highway, Lynwood, Calif.

Wisconsin Fdry. & Mach. Co., 623 E. Main St., Madison 1, Wis.

Wittemann Machy. Co., Farmingdale, N. J.

CONVEYORS, PORTABLE

American Conveyor Co., 1115 W. Adams St., Chicago 7, Ill.

Atlas Conveyor Co., Box 59B, Clintonville, Wis.

Austin-Western Co., 601 Farnsworth Ave., Aurora, Ill.

Barber-Greene Co., 631 W. Park Ave., Aurora, Ill.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Bonded Scale Co., 2166 S. 3rd St., Columbus, Ohio.

Brady Conveyors Corp., 20-A W. Jackson Blvd., Great Northern Bldg., Chicago, Ill.

Continental Gin Co., Industrial Division, P. O. Box 2614, Birmingham 2, Ala.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Conveyor Engineering & Supplies Corp., Hobart Pl. & D. L. & W. RR., Clifton, N. J.

Coyle & Roth, 3024 S. E. 4th St., Minneapolis 14, Minn.

Diamond Iron Works, Inc., 1728 N. 2nd St., Minneapolis 11, Minn.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

A. B. Farquhar Co., Conveyor Division, N. Duke St., York, Penna.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 15, Mo.

George Haiss Mfg. Co., Inc., Div. of Pettibone Mulliken Corp., 351 Canal Place, New York, N. Y.

Hercules Steel Products Co., Galion, Ohio.

Iowa Mfg. Co., 916 N. 16th St., Cedar Rapids, Iowa.

The Jeffrey Mfg. Co., 935-99 N. 4th St., Columbus 16, Ohio.

C. S. Johnson Co., P. O. Box 71, Champaign, Ill.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Lake Shore Engineering Co., Iron Mountain, Mich.

Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Lippmann Engineering Wks., 4603 W. Mitchell St., Milwaukee 14, Wis.

Market Forge Co., Materials Handling Div., 77 Gravey St., Everett 49, Mass.

E. F. Marsh Engineering Co., 4030 Chateau Ave., St. Louis 10, Mo.

M. P. Nelson Iron Works, Inc., 730 Bloomfield Ave., Clifton, N. J.

Northern Conveyor Co., Janesville, Wis.

Pioneer Engineering Wks., Inc., 1515 Central Ave. N. E., Minneapolis 13, Minn.

Rogers Iron Works Co., 10th & Pearl Sts., Joplin, Mo.

Robins Conveyors, Inc., Div Hewitt-Robins, Inc., 270 Passaic Ave., Passaic, N. J.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Trowbridge Conveyor Co., 350 Van Houten Ave., Clifton, N. J.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Universal Engineering Corp., 625 "C" Ave. N. W., Cedar Rapids, Iowa.

The Wilkie Company, 1104 Packard Bldg., Philadelphia, Pa.

Willard Concrete Machy. Co., Ltd., 2906 Imperial Highway, Lynwood, Calif.

Wisconsin Foundry & Machine Co., 623 E. Main St., Madison 1, Wis.

CONVEYORS, SCREW

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Alpha Tank & Sheet Metal Mfg. Co., 5007 S. 38th St., St. Louis 16, Mo.

Atlas Conveyor Co., Box 59B, Clintonville, Wis.

Beaumont-Birch Co., 1505 Race St., Philadelphia, Penna.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Brady Conveyors Corp., 20-A W. Jackson Blvd., Great Northern Bldg., Chicago, Ill.

Butler Bin Co., Waukesha, Wis.

Cement Mill Equipment Co., Box 124, Franklin, Mich.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Conveyor Engineering & Supplies Corp., Hobart Pl. & D. L. & W. RR., Clifton, N. J.

Continental Gin Co., Industrial Division, P. O. Box 2614, Birmingham 2, Ala.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis.

Chicago Steel Foundry Co., 3720 S. Kedzie Ave., Chicago 32, Ill.

Denver Equipment Co., 1400—17th St., Denver, Colo.

Eagle Iron Works, 129 Holcomb Ave., Des Moines, Iowa.

The J. B. Ehrsam & Sons Mfg. Co., Enterprise, Kans.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

Fleming Mfg. Co., Inc., 4985 Fyler Ave., St. Louis 9, Mo.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 15, Mo.

Greenville Mfg. Works, Greenville, Ohio.

Hardinge Co., Inc., 240 Arch St., York, Penna.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

The Jeffrey Mfg. Co., 935-99 N. 4th St., Columbus 16, Ohio.

C. S. Johnson, P. O. Box 71, Champaign, Ill.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.

The McNally-Pittsburg Mfg. Corp., Pittsburg, Kansas.

Meyer Scales & Equipment Corp., 449 Central Ave., Orange, N. J.

D. J. Murray Mfg. Co., Wausau, Wis.

Noble Company, 1366—7th St., Oakland 20, Calif.

Screw Conveyor Corp., 700 Hoffman St., Hammond, Ind.

Sprout, Waldron & Co., Inc., Muncy, Penna.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Sturtevant Mill Co., Harrison St., Boston 22, Mass.

Supremix, Inc., Adrian, Mich.

Webster Mfg., Inc., Tiffin, Ohio.

Wisconsin Foundry & Machine Co., 623 E. Main St., Madison 1, Wis.

CURING ROOM DOORS

Standard Dry Kiln Co., 798 S. Harding St., Indianapolis, Ind.

Universal Door Carrier, Inc., 1117 Cornell Ave., Indianapolis 2, Ind.

CURING ACCELERATORS

Campion Fuel Engrg. Co., P. O. Box 3941, Detroit 27, Mich.

Dri-Fast Process Corp., P. O. Box 13, Rahway, N. J.

Roy D. Emmons, 303 Melrose Ave., Syracuse, N. Y.

D. J. Murray Mfg. Co., Wausau, Wis.

Sullivan Company, 212 E. Trigg Ave., Memphis 2, Tenn.

CURING AGENTS

Anti-Hydro Waterproofing Co., 365 Badger Ave., Newark 8, N. J.

Autolene Lubricants Co., 1331 W. Evans Ave., Denver 9, Colo.

Calbar Paint & Varnish Co., 2612-26 N. Martha St., Philadelphia 25, Pa.

Calcium Chloride Assn., 909 Ring Bldg., Washington 6, D. C.

Carter-Waters Corp., 2440 Penway, Kansas City, Mo.

Ceresit Waterproofing Corp., 512 S. Canal St., Chicago 7, Ill.

Dewey & Almy Chemical Co., 62 Whittemore Ave., Cambridge 40, Mass.

Dow Chemical Co., Midland, Mich.

E. I. DuPont De Nemours & Co., Nemours Bldg., Wilmington 98, Delaware.

A. C. Horn Co., 42-46 10th St., Long Island City 1, N. Y.

Masters Builders Co., 7016 Euclid Ave., Cleveland, Ohio.

Reardon Industries, 2837 Stanton Ave., Cincinnati 6, Ohio.

Spray-O-Bond, 2225 N. Humboldt Ave., Milwaukee 12, Wis.

L. Sonneborn Sons, Inc., 52 Lexington Ave., New York 16, N. Y.

Sullivan Company, 212 E. Trigg Ave., Memphis 2, Tenn.

Truscon Laboratories, Inc., 1640 Caniff Ave., Detroit 11, Mich.

Wyandotte Chemicals Corp., Michigan Alkali Div., Wyandotte, Mich.

CURING EQUIPMENT

Aluminum Products Corp., Pontiac, Mich.

Chase Fdry. & Mfg. Co., 2300 Parsons Ave., Columbus 7, Ohio.

Cole Company, A. J., Chillicothe, Mo.

Dri-Fast Process Corp., P. O. Box 13, Rahway, N. J.

Roy D. Emmons, 303 Melrose Ave., Syracuse, N. Y.

Francis Steam Generator Co., 10202 E. Artesia Blvd., Bellflower, Calif.

Jackson & Church Co., 321 North Hamilton St., Saginaw, Michigan.

Lith-I-Bar Co., Holland, Mich.

Littleford Bros., Inc., 453 E. Pearl St., Cincinnati, Ohio.

Prat-Daniel Corp., 15-2 Meadow St., Norwalk, Conn.

Shore Engineering, 320 Broadway, New York, N. Y.

Truscon Laboratories Inc., 1640 Caniff Ave., Detroit 11, Michigan.

DISPERSING AGENTS

American Fluresit Co. Inc., 4011 Red Bank Rd., Cincinnati 27, Ohio.

American Polymer Corp., Peabody, Mass.

Ceresit Waterproofing Corp., 512 S. Canal St., Chicago 7, Ill.

Dewey & Almy Chemical Co., Cambridge 40, Mass.

Master Builders Co., 7016 Euclid Ave., Cleveland, Ohio.

Onyx Oil and Chemical Co., 190 Warren St., Jersey City 2, N. J.

Reardon Industries, Inc., 2837 Stanton Ave., Cincinnati 6, Ohio.

Sika Chemical Corp., 35 Gregory Ave., Passaic, N. J.

Spray-O-Bond, 2225 N. Humboldt Ave., Milwaukee 12, Wis.

L. Sonneborn Sons, Inc., 83 Lexington Ave., New York 16, N. Y.

Sullivan Company, 312 E. Trigg Ave., Memphis 2, Tenn.

Reardon Industries, 2837 Stanton Ave., Cincinnati 6, Ohio.

DUST COLLECTORS

American Air Filter Co., First & Central Ave., Louisville 8, Ky.

American Blower Corp., 6111 Tireman Blvd., Detroit 32, Mich.

American Wheelabrator & Equipment Corp., 439 S. Byrkit St., Mishawaka, Ind.

Buell Engrg. Co., 70 Pine St., New York 5, N. Y.

Ducon Company, 148 East 2nd St., Mineola, L. I., N. Y.

Green Fuel Economizer Co., Inc., Beacon, N. Y.

Iowa Manufacturing Co., Cedar Rapids, Iowa.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Madsen Iron Works, 5631 Bickett, Huntington Pk., Cal.

Multiplex Machinery Corp., Elmore, Ohio.

Northern Blower Co., 6409 Barberton Ave., Cleveland 2, Ohio.

Pangborn Corp., Hagerstown, Md.

Parsons Engr. Corp., 2545 E. 79th St., Cleveland, Ohio.

Research Corporation, 405 Lexington Ave., New York, N. Y.

W. W. Sly Mfg. Co., 4745 Train Ave., Cleveland, Ohio.

Smidth & Co., F. L., 11 W. 42nd St., New York 18, N. Y.

Western Precipitation Corp., 1016 W. 9th St., Los Angeles 15, Calif.

FLOORING SYSTEMS

American Fluresit Co. Inc., 4011 Red Bank Rd., Cincinnati 27, Ohio.

Basalt Rock Co., Inc., Stresterete Division, Napa, Calif.

Besser Mfg. Co., Alpena, Mich.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

Flexicore Co. Inc., 220 E. 42nd St., New York, N. Y.

Lith-I-Bar Co., Joistlie Div., Holland, Mich.

FORKS, GRIPPING

Lewis-Shepard Sales Corp., 158 Walnut St., Watertown, Mass.

Tracto-Lift Company, 2007 Baltimore, Kansas City, Mo.

Schmidgall Mfg. Co., Fork Division, 307 Cass St., Peoria, Ill.

FORMS, BURIAL VAULT

American Vault Co., 579 Kenilworth Ave., Detroit, Mich.

Ashland Vault Co. Inc., 500-518 Virginia Ave., Ashland, Ohio.

Berg Vault Co., 1630 Lucas Hunt Rd., St. Louis, Mo.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Greenville Mfg. Works, Greenville, Ohio.

Wilbert W. Haase Co., 1005 Troost Ave., Forest Park, Ill.

Norwalk Vault Co., Woodlawn Ave., Norwalk, Ohio.

Richmond Burial Vault Co., 2081 Richmond Terrace, Port Richmond, L. I., N. Y.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Wm. E. Whited, Oak Hill Memorial Park, Escondido, Calif.

FORMS, COATING

A. C. Horn Co., Inc., 10th St. & 44th Ave., Long Island City 1, N. Y.

Sullivan Co., 312 E. Trigg Ave., Memphis 2, Tenn.

Truscon Laboratories, 1640 Caniff Ave., Detroit 11, Mich.

FORMS, COMPOUND

Concrete Machinery Co., P. O. Box 2348, Hickory, N. C.

Homeward Steps Co., 3420 W. 9th St., Des Moines, Iowa.

FORMS, CRIBBING

Baker-Roos, Inc., 602 W. McCarty St., Indianapolis 6, Ind.

Binghamton Metal Forms, Inc., 15-21 Griswold St., Binghamton, N. Y.

Greenville Mfg. Works, Greenville, Ohio.

Kirk & Blum Mfg. Co., 2838 Spring Grove Ave., Cincinnati 25, Ohio.

Universal Concrete Pipe Co., 297 S. High St., Columbus, Ohio.

FORMS, CURB & GUTTER

Binghamton Metal Forms, Inc., 15-21 Griswold St., Binghamton, N. Y.

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Kirk & Blum Mfg. Co., 2838 Spring Grove Ave., Cincinnati 25, Ohio.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

FORMS, FIREPLACE

General Engines Co., 307 Hunter St., Gloucester, N. J.

Henkin Industries, 171 Monroe, Memphis, Tenn.

Edward Lehn, 3738 W. Lapham St., Milwaukee, Wis.

FORMS, FLAT SLAB

Aetna Plywood & Veneer Co., 1751 Elston Ave., Chicago 22, Ill.

Baker-Roos, Inc., 602 W. McCarty St., Indianapolis 6, Ind.

Bethlehem Steel Co., 701 E. 3rd St., Bethlehem, Penna.

Binghamton Metal Forms, Inc., 15-21 Griswold St., Binghamton, N. Y.

Blaw-Knox, Div. of Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Penna.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Kirk & Blum Mfg. Co., 2838 Spring Grove Ave., Cincinnati 25, Ohio.

Price Bros. Co., Box 825, Dayton, Ohio.

Smith Machine Sales Co., 505 5th Ave., New York, N. Y.

Symons Clamp & Mfg. Co., 4249 Diversey Ave., Chicago 39, Ill.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 15, Ill.

FORMS, FLOOR AND ROOF SLABS

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

The Flexicore Co., Inc., 1932 E. Monument Ave., Dayton 1, Ohio.

Greenville Mfg. Works, Greenville, Ohio.

Price Bros. Co., Box 825, Dayton, Ohio.

Sakrete Inc., Fischer Ave. & B. & O. R.R., St. Bernard, Cincinnati 17, Ohio.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Westbilt, Inc., 93 Tiffany Blvd., Newark 4, N. J.

FORMS, GARDEN FURNITURE

Colorcrete Industries, Inc., 510 Ottawa Ave., Holland, Mich.

Concrete Machinery Co., P. O. Box 2348, Hickory, N. C.

Greenville Mfg. Works, Greenville, Ohio.

R. K. Tyra Company, P. O. Forest Lake, Tyra, Minn.

FORMS, GREASE TRAP

Homeward Steps Co., 3420 W. 9th St., Des Moines, Iowa.

Houston Concrete Machinery Co., 114 Heights Blvd., Houston 7, Texas.

CLASSIFIED DIRECTORY

FORMS, JOIST

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

Greenville Mfg. Works, Greenville, Ohio.

Kirk & Blum Mfg. Co., 2328 Spring Grove Ave., Cincinnati 25, Ohio.

Lith-I-Bar Co., Joistile Div., Holland, Mich.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

FORMS, LAUNDRY TRAY

Chicago Granitine Mfg. Co., 4930 S. Rockwell St., Chicago 32, Ill.

Wessels Co., 1625 E. Euclid Ave., Detroit, Mich.

FORMS, MANHOLE COVER AND FRAME

Binghamton Metal Forms, Inc., 15-21 Griswold St., Binghamton, N. Y.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Price Bros. Co., Box 825, Dayton, Ohio.

Quinn Wire & Iron Works, East 12th St., Boone, Iowa.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

FORMS, ORNAMENTAL CONCRETE

Automatic Spring Coiling Co., 4045 W. Thorndale Ave., Chicago 30, Ill.

Colorcrete Industries, Inc., 510 Ottawa Ave., Holland, Mich.

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

General Engines Co., 307 Hunter St., Gloucester, N. J.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

FORMS, PARK BENCH—CONCRETE

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

FORMS, PIPE

Colorcrete Industries, Inc., 510 Ottawa Ave., Holland, Mich.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

Concrete Pipe Machinery Co., 111 George St., Sioux City 9, Iowa.

Eckel Engineering Co., 193 South 1st St., San Jose, Calif.

Houston Concrete Machy. Co., 114 Heights Blvd., Houston, Texas.

Martin Iron Works, P. O. Box 2257, Terminal Annex, Los Angeles, Calif.

Price Bros Co., Box 825, Dayton, Ohio.

Quinn Wire & Iron Works, E. 12th St., Boone, Iowa.

Sherman Concrete Pipe Machinery, Inc., P. O. Box 2034, Knoxville, Tenn.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Universal Concrete Pipe Co., 297 S. High St., Columbus, Ohio.

William Bros. Boiler & Mfg. Co., 1057 10th Ave. S. E., Minneapolis 14, Minn.

Zeidler Concrete Prod. Machy. Co., Newell & Mobile Sts., Waterloo, Iowa.

FORMS, SEPTIC TANK

Ashland Vault, Inc., 500-518 Virginia Ave., Ashland, Ohio.

Berg Vault Co., 1620 Lucas Hunt Rd., St. Louis, Mo.

Carpenter Mfg. Co., R. F. D. No. 1, Box 470, Richmond, Va.

Chase Concrete Machinery, 15 Linwood Ave., Buffalo 2, N. Y.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Greenville Mfg. Works, Greenville, Ohio.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Houston Concrete Machy. Co., 114 Heights Blvd., Houston, Texas.

Norwalk Vault Co., Woodlawn Ave., Norwalk, Ohio.

Quinn Wire & Iron Co., E. 12th St., Boone, Iowa.

Symons Clamp & Mfg. Co., 4249 Diversey Ave., Chicago 39, Ill.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill.

FORMS, SPECIAL ORDER—(MISC.)

Edward Campbell Co., S. E. Corner East & Walnut Rd., Vineland, N. J.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

Quinn Wire & Iron Works, E. 12th St., Boone, Iowa.

FORMS, SPLASH BLOCK

Edward Campbell Co., S. E. Corner East & Walnut Rd., Vineland, N. J.

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

Homeward Steps Co., 2420 W. 9th St., Des Moines, Iowa.

FORMS, STEP

Edward Campbell Co., S. E. Corner East & Walnut Rd., Vineland, N. J.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Homeward Steps Co., 2420 W. 4th St., Des Moines, Iowa.

Kirk & Blum Mfg. Co., 2307 Spring Grove Ave., Cincinnati 25, Ohio.

Pittsburgh Pre-Cast Co., 2615 W. Liberty Ave., Pittsburgh 16, Pa.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

FORMS, WELL CURBING

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Kirk & Blum Mfg. Co., 2307 Spring Grove Ave., Cincinnati 25, Ohio.

Quinn Wire & Iron Works, E. 12th St., Boone, Iowa.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

GLOVES, WORK

Edmont Mfg. Co., 532 Orange St., Coshocton, Ohio.

General Scientific Equipment Co., 27th & Huntington Sts., Philadelphia 32, Penna.

Riegel Textile Corporation, P. O. Box 170, New York 17, N. Y.

GUNS, COLOR SPRAY

Chase Concrete Machinery, 15 Linwood Ave., Buffalo 2, N. Y.

Colorcrete Industries, Inc., 510 Ottawa Ave., Holland, Mich.

Curtis Pneumatic Machy., Div. of Curtis Mfg. Co., 1905 Kienlen Ave., St. Louis 20, Mo.

The DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio.

Spray Engineering Co., 114 Central St., Somerville 45, Mass.

GUNS, CONCRETE PLACING

Cement Gun Co., 1520 Walnut St., Allentown, Pa.

Vita Labor Saving Tools, Inc., Station Plaza, Smithtown Branch, N. Y.

GUNS, GROUT AND CAULKING

Calbar Paint & Varnish Co., 2612-26 N. Martha St., Philadelphia 25, Penna.

A. C. Horn Co., 42-46 10th St., Long Island City 1, N. Y.

Posey Iron Works, Inc., Brick Machinery Div., Lancaster, Pa.

Tamms Industries, Inc., 228 N. LaSalle St., Chicago 1, Ill.

HARDENING AGENTS

American Fluresit Co., Inc., 4011 Red Bank Rd., Cincinnati 27, Ohio.

Anti-Hydro Waterproofing Co., 265 Badger Ave., Newark 5, N. J.

Atlantic Chemicals, Inc., P. O. Box 3466, Orlando, Fla.

Ceresit Waterproofing Corp., 512 S. Canal St., Chicago 7, Ill.

Curtis Pneumatic Machy., Div. of Curtis Mfg. Co., 1905 Kienlen Ave., St. Louis 20, Mo.

Dow Chemical Co., Midland, Michigan.

E. I. DuPont De Nemours & Co., Nemours Bldg., Wilmington 98, Del.

Harshaw Chemical Co., Cleveland, Ohio.

Haynes Products Co., 4007 Farnum St., Omaha 3, Nebr.

A. C. Horn Co., 42-46 10th St., Long Island City 1, N. Y.

Master Builders Co., 7016 Euclid Ave., Cleveland, Ohio.

Reardon Industries, Inc., 2827 Stanton Ave., Cincinnati 6, Ohio.

Solvay Sales Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.

L. Sonneborn Sons, Inc., 88 Lexington Ave., New York 16, N. Y.

Spray-O-Bond Co., 2225 N. Humboldt Ave., Milwaukee 12, Wis.

Stonhard Company, 1306 Spring Garden St., Philadelphia 23, Pa.

Sullivan Company, 212 E. Trigg Ave., Memphis 3, Tenn.

Sika Chemical Corp., 35 Gregory Ave., Passaic, N. J.

Truscon Laboratories, Inc., 1640 Caniff Ave., Detroit 11, Mich.

Wyandotte Chemicals Corp., Michigan Alkali Div., Wyandotte, Mich.

HEATERS, CONCRETE MIXER

Aeroil Burner Co., Inc., 13th St. & Park Ave., West New York, N. J.

Hauck Mfg. Co., 126 10th St., Brooklyn 15, N. Y.

Littleford Bros., Inc., 453 E. Pearl St., Cincinnati, Ohio.

HOISTING EQUIPMENT, CONCRETE

Curtis Pneumatic Machy. Div. of Curtis Mfg. Co., 1905 Kienlen Ave., St. Louis 20, Mo.

Dodson Mfg. Co., Inc., 1463 Barwise, Wichita 2, Kans.

Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 14, Ohio.

F. C. George Machine Co., 100 S. Westmoreland Dr., Orlando, Fla.

Hyster Co., 2926 N. E. Clackamas St., Portland 8, Ore.

Jaeger Machine Co., 520 Dublin Ave., Columbus 11, Ohio.

Kwik-Mix Co., Port Washington, Wis.

Kochring Co., 3026 W. Concordia Ave., Milwaukee, Wis.

Lewis-Shepard Products, Inc., 158 Walnut St., Watertown 72, Mass.

Marvel Equipment Co., 224 S. Michigan Ave., Chicago 4, Ill.

Meyer Scales & Equipment Corp., 449 Central Ave., Orange, N. J.

Mishco Corp., 615 S. W. 2nd Ave., Miami 36, Florida.

Mixermobile Mfrs., 6855 N. E. Halsey St., Portland 16, Oregon.

Muller Machinery Co., Inc., Metuchen, N. J.

Superior-Lidgerwood-Mundy Corp., Superior, Wis.

Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 15, Penna.

JOIST AND SLAB MACHINES

Besser Mfg. Co., Alpena, Mich.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

W. E. Dunn Mfg. Co., Holland, Mich.

Greenville Mfg. Works, Greenville, Ohio.

The Kirk & Blum Mfg. Co., 2307 Spring Grove Ave., Cincinnati 25, Ohio.

The Lith-I-Bar Co., Holland Evening Sentinel Bldg., Holland, Mich.

Mishco Corp., 615 S. W. 2nd Ave., Miami 36, Florida.

Multiplex Machinery Corp., Elmore, Ohio.

KILNS AND DRYERS

Dri-Fast Process Corp., P. O. Box 13, Rahway, N. J.

Hardinge Co., Inc., 240 Arch St., York, Penna.

Heinecken, Inc., W P., 50 Broad St., New York, N. Y.

Jackson & Church, 321 N. Hamilton St., Saginaw, Mich.

F. L. Smidth & Co., 11 W. 42nd St., New York 18, N. Y.

LIFT TRUCKS

1. Electric
2. Gas
3. Handlift
4. Diesel

American Tractor Corp., Churubusco, Ind. 2.

Anchor Concrete Machinery Co., 1191 Fairview Ave., Columbus 12, Ohio. 2.

The Atlas Car & Mfg. Co., 1100 Ivanhoe Rd., Cleveland 10, Ohio. 1. 2. 3.

Automatic Transportation Co., 101 W. 87th St., Chicago, Ill. 1. 2. 3.

Baker Industrial Truck, Div. of The Baker-Raulang Co., 2168 W. 25th St., Cleveland 13, Ohio. 1. 2. 3.

Barrett-Cravens Co., 4629 S. Western Blvd., Chicago 9, Ill. 1, 2, 3.

Buda Company, Harvey, Ill. 1. 4.

Clark Tractractor Div., Clark Equipment Co., Battle Creek, Mich. 1. 2. 3. 4.

Duarte Steel & Equip. Co., 855 E. Meridian St., Duarte, Calif. 2.

Easton Car & Construction Co., Easton, Penna. 2.

Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 14, Ohio. 1. 2. 3.

Erickson Power Lift Trucks, Inc., 1401 Marshall St. N. E., Minneapolis 13, Minn. 2.

Fleming Mfg. Co. Inc., 4985 Fyler Ave., St. Louis 9, Mo. 2.

Gerunger Carrier Co., Dallas, Ore. 2.

Henneuse Engrg. Co., 400 Monroe St., Marion, Ohio.

The Frank G. Hough Co., E. Sunnyside Ave., Libertyville, Ill. 2.

Hyster Company, 2926 N. E. Clackamas St., Portland 8, Ore. 2.

Kwik-Mix Co., Port Washington, Wis. 2.

Lewis-Shepard Sales Corp., 158 Walnut St., Watertown, Mass. 2.

Lift Trucks Inc., 2425 Spring Grove Ave., Cincinnati 14, Ohio. 1. 2. 3.

Market Forge Co., Materials Handling Div., 77 Gravey St., Everett 49, Mass. 1.

Milwaukee Power Equipment Co., 525 N. 22nd St., Milwaukee 3, Wis. 2.

Mixermobile Mfrs., 6855 N. E. Halsey St., Portland 16, Ore. 2.

Praschak Machine Co., Marshfield, Wis. 2, 3.

Powers Equipment Mfg. Co., 512 Monroe St., Anoka, Minn. 2.

Ross Carrier Co., 250 Miller St., Benton Harbor, Mich. 2.

Schmidgall Mfg. Co., Fork Division, 307 Cass St., Peoria, Ill. 1. 2.

Service Caster & Truck Corp., 110 S. Superior St., Albion, Mich. 2.

Silent Hoist & Crane Co. Inc., 841-65 63rd St., Brooklyn 20, N. Y. 2.

Stearns Mfg. Co., Adrian, Mich. 2.

Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio. 1. 2. 3.

Tracto Lift Company, 2011 Baltimore, Kansas City 8, Mo. 2.

Transitier Truck Co., 2477 N. W. 23rd Ave., Portland 10, Ore. 2.

Truckman Div., The Knickerbocker Co., 571 Liberty Ave., Jackson, Mich. 2.

West Bend Equipment Corp., West Bend, Wis. 3.

Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 15, Penna. 1. 2. 3. 4.

LIME PUTTY MACHINERY

Miller-Komline Corp., Peapack, N. J.

LINTEL MACHINES

Kent Machine Co., Cuyahoga Falls, Ohio.

Kirk & Blum Mfg. Co., 2838 Spring Grove Ave., Cincinnati 25, Ohio.

Smith Machine Sales Co., 505 5th Ave., New York, N. Y.

MASONRY SUPPLIES—MISC.

(Anchor Inserts, Expansion Shields & Bolts, Drills, Etc.)

Precision Devices, Inc. (Formerly: Star Expansion Prods. Co.), 147 Cedar St., New York, N. Y.

METERS, WATER

The Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio.

Builders-Providence Inc., 9 Codding St., Providence 1, R. I.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

General Electric Co., 1 River Rd., Schenectady 5, N. Y.

Mishco Corporation, 615 S. W. 2nd Ave., Miami, Fla.

Neptune Meter Co., 50 W. 50th St., New York 20, N. Y.

Spangler Valve Div., Aircraft Fueling Co. Inc., 1535 E. 16th St., Los Angeles 21, Calif.

Westinghouse Electric & Mfg. Co., E. Pittsburgh, Penna.

Worthington Corp., Dunellen, N. J.

METERS, SAND MOISTURE

Rainhart Company, 602-8 W. 34th St., Austin 21, Tex.

Scientific Concrete Service Corp., 734 Salem Ave., Elizabeth, N. J.

Spangler Valve Div., Aircraft Fueling Co. Inc., 1535 E. 16th St., Los Angeles 21, Calif.

Valley Ready Mix Concrete Co., Harlingen, Tex.

MIXERS, CONCRETE (BATCH)

Allied Welding & Mfg. Co., 49 Lorna Doone Blvd., Orlando, Fla.

Anchor Concrete Machinery Co., 1191 Fairview Ave., Columbus 12, Ohio.

Bergen Machine & Tool Co. Inc., 189 Franklin Ave., Nutley 10, N. J.

Besser Manufacturing Co., Alpena, Mich.

Brikerete Associates Inc., 4651 S. Division Ave., Grand Rapids, Mich.

L. Burmeister, Milwaukee 14, Wis.

Chain Belt Co., 1600 Bruce St., Milwaukee, Wis.

Colorcrete Industries, Inc., 510 Ottawa Ave., Holland, Mich.

Columbia Machine Works, 107 South Grand Ave., Vancouver, Wash.

Concrete Equipment Co., 530 Ottawa Ave., Holland, Mich.

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

George E. Christopher & Son Iron Works, 1220 Blaine, Wichita 1, Kan.

Construction Machy. Co., Glenwood & Vinton Sts., Waterloo, Iowa.

The Conveyor Co., 2260 E. Slauson Ave., Los Angeles 58, Calif.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

Denver Equipment Co., 1400 17th St., Denver, Colo.

Dodson Mfg. Co. Inc., 1463 Barwise, Wichita 2, Kans.

W. E. Dunn Mfg. Co., Holland, Mich.

CLASSIFIED DIRECTORY

Chas. Gaiske Mfg. Co., 930 North Ave., Des Plaines, Ill.

General Engines Co., Inc., 307 Hunter St., Gloucester, N. J.

F. C. George Machine Co., 100 So. Westmoreland Dr., Orlando, Fla.

Gilson Bros. Co., Fredonia, Wis.

Hanneuse Engrg. Co., 400 Monroe St., Marion, Ohio.

Houston Concrete Machinery Co., 114 Heights Blvd., Houston 7, Texas.

Jaeger Machine Co., 520 Dublin Ave., Columbus 11, Ohio.

Kent Machine Co., Cuyahoga Falls, Ohio.

Knickerbocker Co., Contractor's Manufacturers Div., Jackson, Mich.

Koehring Co., 3026 W. Concordia Ave., Milwaukee, Wis.

Kwik-Mix Co., Port Washington, Wis.

Lith-I-Bar Co., Holland, Mich.

Miles Manufacturing Co., Jackson, Mich.

Mishco Corporation, 615 S. W. 2nd Ave., Miami, Fla.

Mixermobile Mfgrs., 6855 N. E. Halsey St., Portland 16, Ore. 2.

Mortarless Machine Corp., 2623 Riverside Dr., Los Angeles, Calif.

Muller Machinery Co. Inc., Metuchen, N. J.

Multiplex Machinery Corp., Elmore, Ohio.

Gene Olsen Corp., 401 Grace St., Adrian, Mich.

Praschak Machine Co., Marshfield, Wis.

Smith Machine Sales Co., 505 5th Ave., New York, N. Y.

T. L. Smith Co., 2385 N. 32nd St., Milwaukee 10, Wis.

Blystone Division, Standard Sand & Machine Co., 549 W. Washington Blvd., Chicago 6, Ill.

Stearns Mfg. Co., Adrian, Mich.

Supremix, Inc., Adrian, Mich.

Universal Concrete Pipe Co., 227 S. High St., Columbus, Ohio.

Universal Tampers, Inc., 1530 N. Adams St., Peoria, Ill.

Willard Concrete Machy. Co., Ltd., 2306 Imperial Highway, Lynwood, Calif.

C. M. Wooten Co., 3716 N. Central, Knoxville, Tenn.

Worthington Corp., Harrison, N. J.

MIXERS, CONCRETE (CONTINUOUS)

George C. Christopher & Son Iron Works, 1230 Blaine, Wichita 1, Kan.

Des Plaines Concrete Prod. Machy., 930 North Ave., Des Plaines, Ill.

Fleming Mfg. Co., Inc., 4985 Fyler Ave., St. Louis 9, Mo.

Jones Concrete Machinery Co., 108 Horning Road, Pittsburgh 34, Pa.

Kent Machine Co., Cuyahoga Falls, Ohio.

Lifetime Building Specialties Inc., 519 Brook Haven Dr., Orlando, Fla.

Link Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Leslie C. Miller Supply, Inc., Bedford, Ohio.

Multiplex Machinery Corp., Elmore, Ohio.

Gene Olsen Corp., 401 Grace St., Adrian, Mich.

Posey Iron Works, Inc., Brick Machinery Division, Lancaster, Penna.

Standard Sand & Machine Co., 549 W. Washington Blvd., Chicago 6, Ill.

Superior-Lidgerwood-Mundy Corp., 7 Dey St., New York 7, N. Y.

MIXERS, MORTAR

Chain Belt Co., 1600 Bruce St., Milwaukee, Wis.

Blystone Div., Standard Sand & Machine Co., 549 W. Washington Blvd., Chicago 6, Ill.

Geo. E. Christopher & Son Iron Works, 1230 Blaine, Wichita 1, Kan.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

Construction Machy. Co., Glenwood & Vinton, Waterloo, Iowa.

F. C. George Machine Co., 100 S. Westmoreland Dr., Orlando, Fla.

Gilson Bros. Co., Fredonia, Wis.

Jaeger Machine Co., 520 Dublin Ave., Columbus 11, Ohio.

Kent Machine Co., Cuyahoga Falls, Ohio.

Knickerbocker Co., Contractor's Manufacturers Div., Jackson, Mich.

Kwik-Mix Co., Port Chester, Wis.

Mishco Corp., 615 S.W. 2nd Ave., Miami 36, Florida.

Muller Machinery Co. Inc., Metuchen, N. J.

Multiplex Machinery Corp., Elmore, Ohio.

Posey Iron Works, Inc., Brick Machinery Division, Lancaster, Pa.

Worthington Corp., Dunellen, N. J.

MIXERS, TRUCK

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Chain Belt Co., 1600 Bruce St., Milwaukee, Wis.

Concrete Equipment Mfg. Co., 5627 Tweedy Blvd., South Gate, Cal.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

Conserco Co., River Rd., & B. & O. R.R., Washington, D. C.

Cook Bros. Equipment Co., 1815 N. Broadway, Los Angeles, Calif.

Imperial Construction Equipt. Co., Melrose Park, Ill.

Jaeger Machine Co., 520 Dublin Ave., Columbus 11, Ohio.

Mixermobile Co. Inc., 608 S. Hill St., Los Angeles, Calif.

T. L. Smith Co., 2385 N. 32nd St., Milwaukee 10, Wis.

Transmission & Gear Co., 10421 Haggerty Ave., Dearborn, Mich.

White Motor Co., Cleveland, Ohio.

Willard Concrete Machy. Co. Ltd., 2306 Imperial Highway, Lynwood, Calif.

Worthington Corp., Dunellen, N. J.

MIXING PLANTS, CENTRAL

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

L. Burmeister, Milwaukee 14, Wis.

Butler Bin Co., Waukesha, Wis.

Chain Belt Co., 1600 Bruce St., Milwaukee, Wis.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

Construction Machy. Co., Glenwood & Vinton Sts., Waterloo, Iowa.

The Conveyor Co., Inc., 2240 E. Slauson Ave., Los Angeles 11, Calif.

Dodson Mfg. Co., 1463 Barwise, Wichita 2, Kans.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

Fleming Mfg. Co. Inc., 4985 Fyler Ave., St. Louis 9, Mo.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

C. S. Johnson, P. O. Box 71, Champaign, Ill.

Mixermobile Co., Inc., 608 S. Hill St., Los Angeles, Calif.

Multiplex Machinery Corp., Elmore, Ohio.

Noble Co., 1860 7th St., Oakland 7, Calif.

T. L. Smith Co., 2385 N. 32nd St., Milwaukee 10, Wis.

Stephens-Adamson Mfg. Co., 7 Ridgeway Ave., Aurora, Ill.

Sturtevant Mill Co., Harrison St., Boston 22, Mass.

Supremix, Inc., Adrian, Mich.

Worthington Corp., Dunellen, N. J.

OFFBEARERS

Bergen Machine & Tool Co. Inc., 189 Franklin Ave., Nutley 10, N. J.

Besser Mfg. Co., Alpena, Mich.

Columbia Machine Works, 107 South Grand Ave., Vancouver, Wash.

F. C. George Machine Co. Inc., 100 S. Westmoreland Dr., Orlando, Fla.

The Kent Machine Co., Cuyahoga Falls, Ohio.

Lith-I-Bar Co., Holland, Mich.

Mishco Corporation, 615 S. W. 2nd Ave., Miami, Fla.

Multiplex Machinery Corp., Elmore, Ohio.

Gene Olsen Corp., 401 Grace St., Adrian, Mich.

Smith Machine Sales Co., 505 5th Ave., New York, N. Y.

Stearns Mfg. Co. Inc., Adrian, Mich.

PACKER—HEAD WINGS

Texas Foundries, Lufkin, Texas.

PAINTS AND COATINGS, CONCRETE

American Fluresit Co., Inc., 4011 Red Bank Rd., Cincinnati 27, Ohio.

American Bitumuls Co., 200 Bush St., San Francisco 4, Calif.

Anti-Hydro Waterproofing Co., 265 Badger Ave., Newark 5, N. J.

Calbar Paint & Varnish Co., 2612-26 N. Martha St., Philadelphia 25, Penna.

Carter-Waters Corp., 2440 Pennway, Kansas City, Mo.

Ceresit Waterproofing Corp., 513 S. Canal St., Chicago 7, Ill.

Colorcrete Industries, Inc., 510 Ottawa Ave., Holland, Mich.

W. E. Dunn Mfg. Co., Holland, Mich.

E. I. du Pont De Nemours & Co., Inc., Wilmington, Del.

CLASSIFIED DIRECTORY

A. C. Horn Co., 43-46 10th St., Long Island City 1, N. Y.

Hydroso Products, Inc., 2230 University Ave., Madison 5, Wis.

Kay-Tite Co., West Orange, N. J.

Masonry Concentrates, Inc., Holland, Mich.

Master Builders Co., 7016 Euclid Ave., Cleveland, Ohio.

Material Chemical & Mfg. Co., 3617 S. May St., Chicago 9, Ill.

Medusa Portland Cement Co., 1000 Midland Bldg., Cleveland 15, Ohio.

Penn Crete Products Co., 20th & Lippincott Sts., Philadelphia 32, Pa.

Reardon Industries Inc., 2627 Stanton Ave., Cincinnati 6, Ohio.

Sakrete Inc., Fischer Ave. & B. & O. R. R., St. Bernard, Cincinnati, Ohio.

Sika Chemical Corp., 35 Gregory Ave., Passaic, N. J.

L. Sonneborn Sons, Inc., 88 Lexington Ave., New York 16, N. Y.

Stonhard Company, 1306 Spring Grove St., Philadelphia 23, Pa.

Sullivan Company, 212 E. Trigg Ave., Memphis 2, Tenn.

Surface Protection Co., 16823 Euclid Ave., Cleveland 12, Ohio.

Spray-O-Bond Co., 2225 N. Humboldt Ave., Milwaukee 12, Wis.

Tamms Industries, Inc., 228 N. La Salle St., Chicago 1, Ill.

Tremec Company, 3122 Roanoke Rd., Kansas City 8, Mo.

Truscon Laboratories, Inc., 1640 Caniff Ave., Detroit 11, Calif.

United Paint & Varnish Co., 2128 Niagara St., Buffalo, N. Y.

United States Gypsum Co., 300 W. Adams St., Chicago 6, Ill.

Utility Color Co., 377-99 Frelinghuysen Ave., Newark 5, N. J.

PALLETS, STEEL, WOOD, FOR CONCRETE PRODUCTS

Anchor Concrete Machinery Co., 1191 Fairview Ave., Columbus 12, Ohio.

Besser Mfg. Co., Alpena, Mich.

Chase Fdry. & Mfg. Co., 2300 Parsons Ave., Columbus 7, Ohio.

Columbia Machine Works, 107 South Grand Ave., Vancouver, Wash.

Commercial Shearing & Stamping Co., Youngstown, Ohio.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

Fabricators Steel Mfg. Corp., 850 E. 133rd St., New York, N. Y.

Frantz Pattern & Foundry Co., 2201 E. Artesia St., Long Beach 5, Calif.

Fleming Mfg. Co. Inc., 4935 Fyler Ave., St. Louis 9, Mo.

General Engines Co., Inc., 307 Hunter St., Gloucester, N. J.

F. C. George Machine Co., 100 Westmoreland Dr., Orlando, Fla.

Helmick Fdry. Machine Co., 101 8th St., Fairmont, W. Va.

Kent Machine Co., Cuyahoga Falls, Ohio.

Kirk & Blum Mfg. Co., 2307 Spring Grove Ave., Cincinnati 25, Ohio.

Lewis-Shepard Sales Corp., 153 Walnut St., Watertown, Mass.

Lith-I-Bar Co., Holland, Mich.

Market Forge Co., Materials Handling Div., 77 Gravey St., Everett 49, Mass.

Martin Iron Works, P. O. Box 2357, Terminal Annex, Los Angeles, Calif.

Miles Manufacturing Co., Jackson, Mich.

Misheo Corp., 615 S. W. 2nd Ave., Miami 36, Florida.

Mortarless Machine Corp., 3623 Riverside Dr., Los Angeles, Calif.

Multiplex Machinery Corp., Elmore, Ohio.

Gene Olsen Corp., 401 Grace St., Adrian, Mich.

Pallet Systems Inc., 120 Guardian Bldg., Cleveland 14, Ohio.

Schmeller Aluminum Foundry Co., 3300 E. 87th St., Cleveland 4, Ohio.

Sherman Concrete Pipe Machinery, Inc., P. O. Box 3034, Knoxville, Tenn.

Southeast Steel Sales Co., 100 W. Amelia St., Orlando, Fla.

Stearns Mfg. Co., Adrian, Mich.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

PALLET CLEANERS

Bergen Machine & Tool Co., 189 Franklin Ave., Nutley 10, N. J.

Columbia Machine Works, 107 South Grand Ave., Vancouver, Wash.

Multiplex Machinery Corp., Elmore, Ohio.

Springfield Pallet Cleaner & Mfg. Co., 501 Southwood Dr., Springfield, Ohio.

PALLET RINGS (UNBREAKABLE)

Texas Foundries, Lufkin, Texas.

PALLET UNLOADER

Hauser Machine Company, P. O. Box 7116, Sylvania Station, Fort Worth, Texas.

PIPE MACHINES

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Concrete Equipment Co., 520 Ottawa Ave., Holland, Mich.

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

Concrete Pipe Machy. Co., 111 George St., Sioux City, Iowa.

General Engines Co., 307 Hunter St., Gloucester, N. J.

Houston Concrete Machy. Co., 114 Heights Blvd., Houston, Texas.

Martin Iron Works, P. O. Box 2357, Terminal Annex, Los Angeles, Calif.

Gene Olsen Corp., 401 Grace St., Adrian, Mich.

Quinn Wire & Iron Works, E. 12th St., Boone, Iowa.

Sherman Concrete Pipe Machinery, Inc., P. O. Box 3034, Knoxville, Tenn.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Universal Concrete Pipe Co., 297 S. High St., Columbus, Ohio.

Zeidler Concrete Products Machinery Co., Newell & Mobile Sts., Waterloo, Iowa.

PLYWOOD, FOR CONCRETE FORMS

Douglas Fir Plywood Assn., Tacoma 2, Washington.

PROPORTIONING EQUIPMENT

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland, Ohio.

Butler Bin Co., Waukesha, Wis.

Dewey & Almy Chemical Co., Cambridge 40, Mass.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

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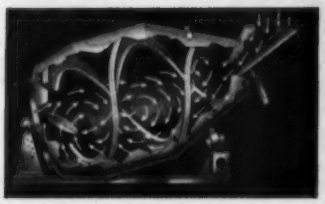

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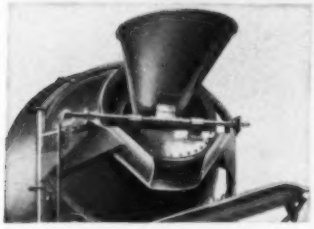

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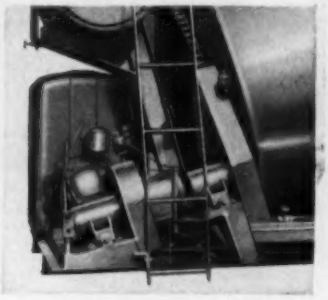

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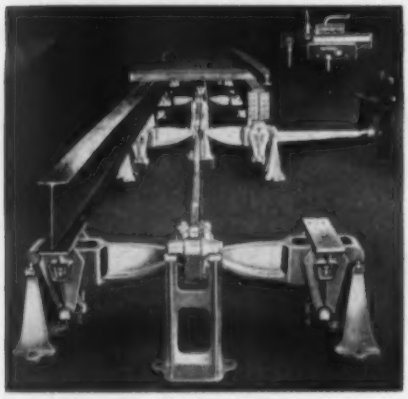
3 *"We are able to have all our stock stored in one place."* One day in steam room is equivalent to 28 days in open air. Boxes are being set in storage yard, ready for delivery by truck.

4 *"We are no longer limited as to size or weight of products."* These electrical conduit boxes measure 24x42x24 in., weigh 500 pounds each. Hyster 40 is removing them from storage for loading on delivery truck.

Save space and labor, cut handling costs with Hyster Lift Trucks. Ask your Hyster dealer for a materials handling study of your operation. Write for literature.

HYSTER COMPANY
THREE FACTORIES
2930 N. E. CLACKAMAS STREET . . . PORTLAND 8, OREGON
1929 NORTH ADAMS STREET . . . . . PEORIA 1, ILLINOIS
1929 MYERS STREET . . . . . DANVILLE, ILLINOIS



TRACK SCALE

Railroad track scales. Capacities of 80 tons or 125 tons.

Cement Storage

This bin → shipped in sections field bolted

Plant of Pottstown Cement Block Co., Pottstown, Penna. Consists of 600 bbl. round bin, elevated above mixer for concrete blocks. Elevator, storage bin, and screw conveyor designed and fitted to their condition.

Plant of G. & W. H. Corson — Plymouth Meeting, Pa.

Concrete Plant Central Mix Type

- *Bin is eight (8) compartment*
- *Batcher and Mixer 2 cu. yd.*
- *Belt Conveyor is 24" x 240'*
- *Mixer carried on separate concrete piers*

Concrete Plants — either central mix or dry batch.

Cement storage bins and batchers, with elevators, etc.

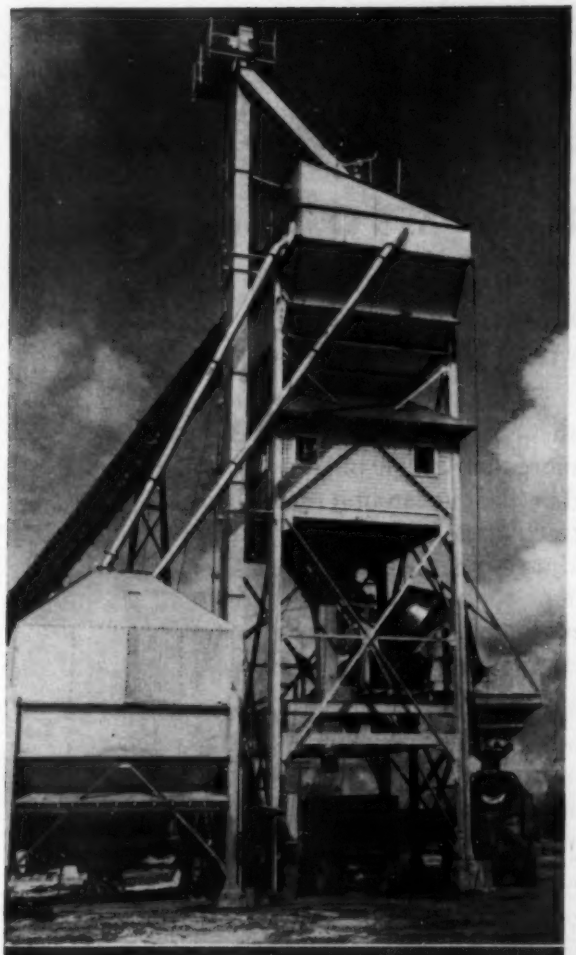
Bins — Elevators — Screw Conveyors — Belt Conv. — Batchers — Scales

We design, fabricate complete plants under one contract.

Inquiries Invited

FANNING SCHUETT ENGINEERING CO.

Phila., Pa., 4325 N. 3rd Street **New York (7) N. Y., 220 Broadway**



READY MIXED DEMAND IS ON THE MARCH!

Make Your Plans Now!

Even small communities such as Hartford, Wis. and Washington Court House, Ohio, offer profitable markets for your BUTLER Ready Mixed Concrete Plant.

Farming communities with as few as 1000 people have a constant and growing demand for Ready Mixed Concrete, because concrete has more and more applications to modern farming practices. The nearest plant gets the business.

Yet there are thousands of communities—and many of them are large—where Ready Mixed Plants are not yet installed. Make your plans now to get into this rapidly growing field.

And be sure your plant is built by BUTLER for BUTLER engineers have the ingenuity and "know-how" born of many, many years of experience to make a maximum profit for you.

That fact is attested by hundreds of Ready Mixed operators who wisely turned to BUTLER.

Here's a comprehensive showing of BUTLER Ready Mixed Concrete Plants—big and small. Send for it today. Ask for Bulletin 185.

BUTLER BIN CO.
987 Blackstone Avenue
Waukesha, Wisconsin

Pit and Quarry Helps You Operate More Profitably

Every issue of PIT AND QUARRY is full of information you can use in your business. It gives you practical ideas on every phase of your operations.

To keep its readers fully informed, PIT AND QUARRY taps every source. Our field editors travel more than 30,000 miles a year to describe the processes and methods used by the outstanding plants making your type of product. Government activities affecting the field are interpreted so that you can better adjust your business to their regulations. Complete reports of all important conventions are published in PIT AND QUARRY. The new equipment and supplies which may make production more efficient are announced in each issue.

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We Produce .....

8-52

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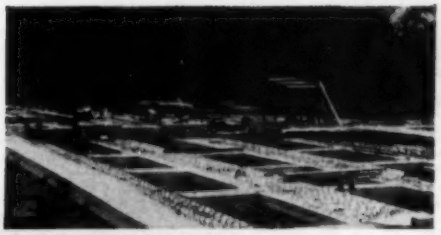
widely endorsed



ayr trap

THE AIR-ENTRAINING AGENT FOR CONCRETE

a large ready-mix plant: "Having used Ayr-Trap for the past four years with very satisfactory results places us in a position to recommend it to all ready-mix concerns."

a concrete block company: "We heartily recommend Ayr-Trap. The quality of the block is much improved and the appearance much better. The whole operation in making the blocks is easier."

a general contractor: "Horn Ayr-Trap is very beneficial to our construction due to the type of aggregate we use. The Ayr-Trap controls the set of the mortar by functioning as a dispersing agent."

a mining company: "We are firmly convinced that the use of Ayr-Trap makes a much more workable concrete, that stripped work has a much better appearance with a much greater resistance to damage from freezing."

Used in the newest State Turnpike circle and bridge construction

for heavy concrete construction

Ayr-Trap can be added at batching plants or on the job. It makes concrete more durable, increases its plasticity and minimizes segregation and bleeding. Increased plasticity with Ayr-Trap insures better placement of concrete in and around closely spaced reinforcing bars. Ayr-Trap develops high resistance to moisture absorption and attack from freezing and thawing forces.

road building

Ayr-Trap improves scaling resistance and protects pavements against the destructive action of chloride salts for ice, snow removal.

OTHER BENEFICIAL PROPERTIES

- Permits a reduction in the water cement ratio.
- Used in liquid form as follows:
  3 liquid ounces per cubic yard of 5 or 6 bag mix.
  1 pint for 5 cubic yards, 6 bag mix.

HORN

A. C. HORN COMPANY, Inc. est. 1897

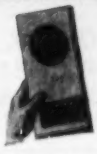
Manufacturers of materials for building maintenance and construction
LONG ISLAND CITY 1, N. Y. • Los Angeles • San Francisco • Houston
Chicago • Toronto SUBSIDIARY OF SUN CHEMICAL CORP.

CM-2

A. C. HORN COMPANY, INC.,
Long Island City 1, N. Y.
Please send me ☐ complete data on AYR-TRAP

HORN

☐ free copy of your 96-page Construction Data Handbook



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Concrete Manufacturer Classified Section

431 S. DEARBORN ST., CHICAGO 5, ILL.

Advertising Rate Per Issue: $10.00 a Column Inch. Lower Rates on a Contract Basis — Write for Rate Card.

[Additional Classified Ads on Pages 211-219]

SPECIAL

- 4 Model 4HM, Jaeger Hi Discharge Mixers, Mounted on G. I. K8 International Trucks. Some with wide base wheels and 10.00 tires. Cleaned and painted, otherwise as is ..... $1,995 each

also

- Jaeger Model 2HM, Hi Discharge Streamliner. Reconditioned, sand blasted & painted..... $995
- Jaeger Model 3HM, Hi Discharge Streamliner. Reconditioned, sand blasted & painted..... $1,250
- Jaeger Model 4½ HM, Hi Discharge Streamliner. Reconditioned, sand blasted & painted..... $1,750
- Jaeger Model 4½ HM, as is from $750
- Challenge 3 Yard Mixers, 1948 and later. Truck mounted, from $2,750
- Challenge 1950 5 Yard, reconditioned $3,150

Because of the great demand for new and larger Challenge Mixers, we have one of the largest stocks of used mixers on the market. These and many other good values, resulting from "trade-ins" are now available. Tell us your needs . . . we'll send you snap-shots of the equipment together with complete information.

COOK BROS. Equipment Company

1815 No. Broadway, Los Angeles 31, Calif.

Telephone: CApitol 2-9111

UNBREAKABLE

PALLET RINGS

Write for full information

TEXAS FOUNDRIES

LUFKIN, TEXAS

SUMMER CLEARANCE

SHOVELS & CRANES

Insley "K-14" **Used** ¾ yd. Dragline
Insley "K-12" **Used** ½ yd. Dragline
Insley "K-10" **Used** ⅜ yd. Shovel
Bantam **Used** Drag & Hoe, on GMC 6x6

TRANSIT MIXERS

Jaeger 3 yd. Hi-Discharge Mixer w/ or w/o 1950 Int. LP190 Tandem Truck
Rex 3 yd. 1950 Model Hi-Discharge Moto-Mixer w/Ford Tandem Truck @ $5,500.00
Rex "27E" Paver. Big Drum. Reduced to $2250.00

MISCELLANEOUS

Diamond 21 yd. **New** Storage Bin
Schramm "60" **Used** Portable Compressor. New Guarantee. Reduced
Universal Port. Pulverizer Plant: #5 Pulverizer, Murphy "ME-66" diesel power, plate feeder, 4 x 8 screen, etc. Pneumatics.
Port. Pulverizing Plant: Universal #4 Pulverizer, Murphy diesel power, screen, closed circuit, pneumatics.
Cummins Diesel — Electric Plant, 50 KW. Priced right.

EIGHMY EQUIPMENT COMPANY
120 S. PIERPONT ROCKFORD, ILLINOIS

FOR SALE

Stearns #7 Joltcrete complete with control boxes, automatic carriage, height control.
4", 8", 12" attachment complete with modular pressed steel pallets.
Air off-bearer.
Pallet dunker.
Turn table.
34 steel racks.
30' elevator.
Kent #2 continuous mixer.

PONTIAC CONCRETE COMPANY
RR #4 Phone 3677
Pontiac, Illinois

FOR SALE

O.K. Manufacturing Automatic Stave Silo Machinery. Nine hundred pallets, automatic feeder and stacker, door frame mold, rod bender, etc. Machinery and accessories in exceptionally good condition. Run approximately 3 months. Due to increase in block sales, we are unable to handle silo business. Building site and prospective customer list available if desired. Good opportunity for the right party.

SPOONER CONCRETE PRODUCTS
Spooner, Wisconsin

BULK-CEMENT BINS

AGGREGATE-CEMENT BINS

CEMENT CONVEYING SCREWS

WEIGH-BATCHING EQUIPMENT

CEMENT-AGGREGATE ELEVATORS

L. K. LIPPERT COMPANY
212 E. 1st St. (phone 18) LONDON, O.

LOWER COST

PACKER-HEAD WINGS

Proved to last as long or longer — yet cost considerably less. Write for prices.

TEXAS FOUNDRIES
LUFKIN, TEXAS

CEMENT COLORS

All shades and grades the highest quality.
Write for color cards, prices and samples

RICKETSON MINERAL COLOR WORKS
MILWAUKEE 2, WISCONSIN
Established 1886

100,000
PRESSED STEEL PALLETS
In Stock

Send tracing or pallet for quotation.

GENERAL CONCRETE EQUIPMENT CO.
307 Hunter Street
Dept. PQ
Gloucester, New Jersey

FOR SALE

Complete Block Plant in Westchester County, N. Y. Good market—K3 Besser machine—50 cu. ft. Mixer—2000 Pallets—50 Racks—Clark platform truck—Fork truck—Welding machine and two delivery trucks—plant in operating condition—For machinery and business $7000.00. Will sell separate items. Half cash.

BOX NO. S-7, c/o The Concrete Manufacturer
431 South Dearborn Street Chicago 5, Illinois

FOR SALE

Complete BARTILE outfit costing $1000 at only $600. Used only two weeks. Other interests.

VICTOR E. JACOBSON
326 Rice Street Anoka, Minnesota

FOR SALE

1—New Appleg-Yellen Air Operated 2 block Machine.
1—7½ H.P. Ingersoll-Rand Air Compressor; 1 Air Lift.
2000—8" Aluminum Pallets; 1250—4" Pallets; 1 Clark Platform Lift Truck.

All for the price of $6000.00!
Machine can be seen in operation.

EAST SIDE CONCRETE SUPPLY COMPANY
812 8th St. Altoona, Pa.

FOR SALE

Pallets—steel—approximately 2000 5/32" x 12" x 18", for Brikcrete or other uses. All square, straight & in good condition. $1.00 each.

CAMP DENNISON CONCRETE BLOCK CO.
7219 Ohio Ave., Silverton 36, Ohio
Phone: Terrace 3815 SYcamore 7585

MINERAL COLORS

for

BRICK MORTAR
STUCCO-PLASTER-CONCRETE

"Fine Because of Their Fineness"
Ask for samples and recommendations.

BLUE RIDGE TALC CO., INC.
HENRY, VIRGINIA

YOURS TO SERVE

If you have not found the equipment you are looking for, the research dept. of The Concrete Manufacturer can and will gladly assist you. Tell us what it is . . . Write to

Research Dept.
C/O The Concrete Manufacturer
431 S. Dearborn St. Chicago 5, Illinois

CONCRETE MANUFACTURER CLASSIFIED SECTION

Wanted To Purchase

Model "R" McCracken Pipe Machine Together with or without mixer and equipment.

Box No. S-10, c/o Concrete Manufacturer
431 S. Dearborn Street, Chicago 5, Ill.

CEMENT COLORS

Write for free samples and prices of "LANSCO" CEMENT COLORS produced in 24 attractive shades. Packed in bulk and in 1 lb. and 5 lb. packages.

manufactured by
LANDERS-SEGAL COLOR CO.
71 Delevan St. Brooklyn 31, N. Y.

SUPERINTENDENT WANTED

Established large Central New York block producer has opportunity for plant superintendent. Working knowledge of Vibrapac machines, high quality production and materials handling methods preferred, but not demanded. Good starting salary and incentive plan for the man who is capable of maintaining top-level operating efficiency. In reply furnish data as to experience, age, education, and health. Golden opportunity for the right man.

Box S-8,
c/o The Concrete Manufacturer
431 South Dearborn St., Chicago 5, Ill.

FOR SALE

1—Champion Drain Tile Machine complete with 7½ HP motor—racks—attachments 4"—6"—8" tile.
1—Stearns Clipper A Block Machine with pallets—racks.
Both A1 condition—Bargain prices.

INDIANAPOLIS DUNBRIK COMPANY
2321 Kentucky Avenue Indianapolis, Indiana
Phone Belmont 4841

"GOOD WILL BUILDERS"

That fit in the concrete block business. U.B. Linestretchers—Line Pins—Corner Line Blocks —Twigs & Jointing tools for the blocklayer by

UNITED BUILDERS
1822 Lindberg Drive, Muskegon, Mich.

FOR SALE

Stearns #9 Joltcrete with air off-bearer.
Relinable 8" and 12" mold boxes (new).
4" mold box (used) good condition.
3270 12" Pallets Modular 45%.
4000 8" Pallets Modular 45%.
6500 4" Standard pallets.
Some new spare parts. Can be seen operating for next 30 days. Machine in excellent condition.

Walter S. Giddings
P. O. Box 126 Atco, N. J.

PLANT FOR SALE

Concrete products plant in a prosperous Kansas city. No competition in area. Manufacture blocks and Ready-Mix. Very liberal financing available. Capital needed only for partial replacement of equipment.

Write Box 255, Newton, Kansas

FOR SALE

No. 9 Joltcrete, 45% void pallets, racks, turn table, and mold boxes for manufacture of 4", 6", 8", and 12" concrete block.

BOX NO. S-2, c/o the Concrete Manufacturer
431 South Dearborn Street Chicago 5, Illinois

FOR SALE

1—Praschak two block, Block Machine has been in use eighteen months. 3000—8" Cored steel pallets. Reason for removing going to larger equipment. Price—$3,500.00 F.O.B. Springfield, Mo.

GLENSTONE BLOCK CO.
928 S. Glenstone Springfield, Mo.
Phone 4-1501

FOR SALE

1500—new, roller flatened ¼" x 18½" x 26" pallets. Reasonable.

Write, phone or wire

TIMMER & KARSTEN
32 Coolidge Ave. Holland, Mich.

WANTED:

Salesman to handle complete line of concrete equipment in various territories in western half of U. S. Must be familiar with the concrete industry. All applications reviewed in confidence.

Write Box No. M-9, c/o The Concrete Manufacturer
431 South Dearborn Street Chicago 5, Illinois

Excellent Ready Mixed Concrete, block & light contracting for sale, ill health—reason for selling.

Box No. S-15, c/o Concrete Manufacturer
431 S. Dearborn St., Chicago 5, Ill.

VERMICULITE

Several desirable exclusive territories available. Expand vermiculite at your plant for aggregate, insulation, fertilizer, etc., under license of nationally active corporation. Offers many possibilities for aggressive Concrete Products organizations. **Write to VERMICULITE—Box No. S-12 c/o The Concrete Manufacturer, 431 South Dearborn St., Chicago 5, Ill.**

IDLE EQUIPMENT WASTES MONEY

A good way to get back a large part of the money you spent for equipment you're no longer using is to SELL IT.

And, the best way to sell it is through the Concrete Manufacturer, the Market Place for supplies and services.

Let someone else have the benefit of equipment you can't use in exchange for hard cash you can use in other ways.

So important is the Concrete Manufacturer used equipment section that many readers (and there are over 24,000 of them—all potential buyers) turn to it first when C M arrives on their desk.

Tell us what you have to offer for sale or trade, we'll set up the ad for you. Mail today and watch the results.

THE CONCRETE MANUFACTURER
431 South Dearborn St., Chicago 5, Ill.

FOR SALE

1 Allis-Chalmers 10-K Gyratory Crusher complete—less drive. This crusher taken out of service in February, 1952 and replaced with a larger machine.

OR

Parts in excellent condition for Allis-Chalmers 10-K Gyratory Crusher as follows:

1 Mainshaft assembled with head center, manganese steel mantle and head nut.
1 Mainshaft assembled with head center, steel mantle and head nut.
1 Eccentric (not babbited) without gear.
1 Eccentric (not babbited) with gear.
1 Spider, cast steel.
1 Drive shaft with pinion.
1 Spider cap.

Box M-4, c/o Pit and Quarry,
431 S. Dearborn Street Chicago 5, Ill.

KNIGHTON PROCESS

U. S. Patent No. 2,601,532

FACED BLOCKS

Blocks faced with natural stone by the Knighton Process are moisture proof without additional treatment. They have been widely used in churches, commercial buildings, schools, apartments and swimming pools, as well as homes.

Knighton Process Faced Blocks are:

Waterproof	Freezeproof
Available in colors	Low in cost
Clean	Smooth

Faced Inwardly — A beautiful finished permanent wall
Faced Outwardly — A durable, insulated exterior wall

Cut building costs and enhance the value of property.

Exclusive franchises under the Knighton Process Available

KNIGHTON FRANCHISE DISTRIBUTING COMPANY

3053 Highland Avenue **Birmingham, Alabama**

Worried about a DRYER or KILN Problem? ■

. . . consult HEINEKEN

"ENGINEERS" in supplying modern, high-efficiency Dryers and Kilns to producers of light weight aggregates, cement, ores, limestone, phosphates, industrial clays, chemicals, sand and gravel, and allied products.

W. P. HEINEKEN, INC.

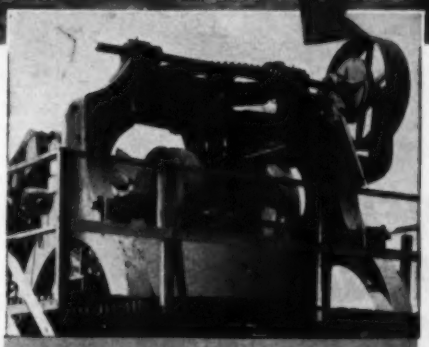
Engineers and Manufacturers

50 BROAD STREET • **NEW YORK, N. Y.**

for fast and effective solutions! ■

Do You Need Big Volume, Low Cost GRINDING?

"AMERICAN" No. 9 Grinder at work for Columbia Concrete Products Co., Toledo, Ohio



Here's what this "American" No. 9 Grinder will do for YOU...

- Easily deliver up to 30 yards per hour
- Grind wet or dry
- Prepare accurately-sized aggregate from such materials as

CINDERS	**HAYDITE**
SLAG	**PUMICE**

- Require practically no maintenance
- Assure years of trouble-free operation

Complete "American" Grinder specifications sent on request . . . and the experience of an "American" grinding specialist is available to you without obligation. Write, wire or phone.

Typical "American"—planned installations successfully delivering daily plant requirements at a profit . . .

CONNECTICUT
Waterbury • *Waterbury Ready Mixed Concrete Co.*

MISSOURI
St. Louis • *Mississippi Glass Company*

NORTH CAROLINA
Rosford • *Hope Concrete Company*

OHIO
Cleveland • *Atlas Block Company*
Columbus • *Wollnitz Tru-Block Co.*
Mansfield • *Cement Products Company*
Toledo • *Columbia Concrete Products*

PENNSYLVANIA
Saco Siding • *Strackbein Cinder Block Co.*

TENNESSEE
Elizabethton • *Appalachian Shale Products Co.*

TEXAS
Eastland • *Texas Lightweight Aggregate Co.*

VIRGINIA
Charlottesville • *H. T. Farran Cinder Block Co.*
Fredericks • *Prestwitten Cinder Block Co.*
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W. VIRGINIA
Canada • *Union Concrete Pipe Co.*

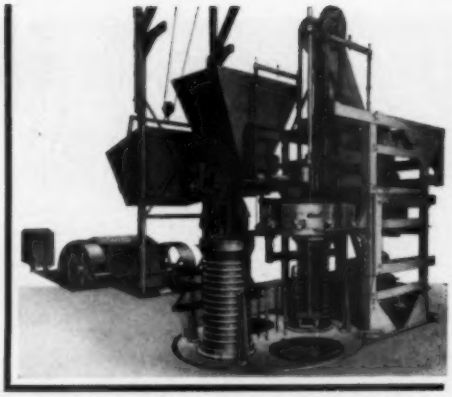
American GRINDERS

By W. A. RIDDELL CORP., Bucyrus, Ohio

You Can't Match McCracken

FOR CONCRETE PIPE PRODUCTION

1. Doubles production in all sizes 4" to 36".
2. Handles 90% of suburban market—80% of metropolitan market.
3. Does twice the business with half the inventory.
4. Makes all the sizes in which machine-made production and fixed-plant operation offer any real economy.
5. Produces quality pipe to meet all requirements with liberal margin of safety.
6. Reduces cost from 50% to 10%—50% on the 6" size down to 10% on the 36" size.
7. A wide range of sizes with lowest costs in every size it makes.
8. More *results*—you can't sell a lemon to the same man twice.



MODEL "T" (Pictured Above)—4" to 36"; MODEL "R"—4" to 18"; MODEL "D" for Drain Tile—sizes 4" to 16"

WRITE FOR COMPLETE INFORMATION TO DEPT. CPS at any of the following addresses:

Eastern Representative
Harry E. Amar
211 East 149th St.
New York 51, N. Y.

Central & South American Agent
George W. Hoffmann
Apartado Postal 1173
Mexico, D. F.

MAIN OFFICE AND FACTORY, SIOUX CITY, IOWA

CONCRETE PIPE MACHINERY CO.
SIOUX CITY, IOWA

HERE'S YOUR COPY

of this new catalog on

Erickson

POWER LIFT TRUCKS

ERICKSON GIVES YOUR BUSINESS A LIFT

This catalog brings you a clear-cut picture of WHY Erickson Power Lift Trucks are so economical—and so successful in speeding up block or pipe handling at reduced costs:

FORK MODELS—from 5,000 to 16,000 lbs. capacity.
SIDE-SHIFTER—for faster stockpiling and loading.
PLATFORM MODELS—5,000, 6,000, and 7,000 lbs. capacity.
4 SPEEDS FORWARD, 4 SPEEDS REVERSE—available on all models for speedier operation.
"CUSTOM-BUILT"—Erickson design allows easy modification.

REQUEST YOUR COPY TODAY

Before you invest in any lift truck, it will pay you to investigate what Erickson has to offer—then compare values!

Erickson POWER LIFT TRUCKS, Inc.

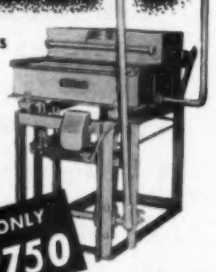
1403 Marshall St. N. E. — Minneapolis 13, Minn.

NEW RAINBOW ROCK MACHINE

Makes $200. Profit a Day!

NEW BUILDING MATERIALS CUTS DOWN COSTS — OFFERS HIGH PROFITS

Startling new Rainbow Rock Slump Brick offers new building opportunities. Presents a modernistic effect at very low-cost for facing interior and exterior walls, fireplaces, steps, etc. Rocks made of concrete mix in varied soft pastel colors. Each 2 ft. long; 3½ inches wide, and heights of 1½, 2½ and 3½ inches. Because they are easier to lay up, and units are larger, they cut labor costs by one-third!



ONLY $750 F.O.B. FACTORY *Complete with Motor*

RAINBOW ROCK MACHINE EASY — SIMPLE TO OPERATE! MAKES LARGE PROFITS!

Make up to 1500 Rainbow Rock Slump Brick in one day. Profits over $200 per day. Machine made of sturdy steel. Welded throughout. Operates indoors or out in little space. Uses wood pallets cut from 2 x 4 lumber. Comes complete with 1 H.P. electric motor, or powered by gasoline engine attachment for bullnose brick; full mixing formulas and instructions included.

WRITE OR PHONE FOR FREE LITERATURE!

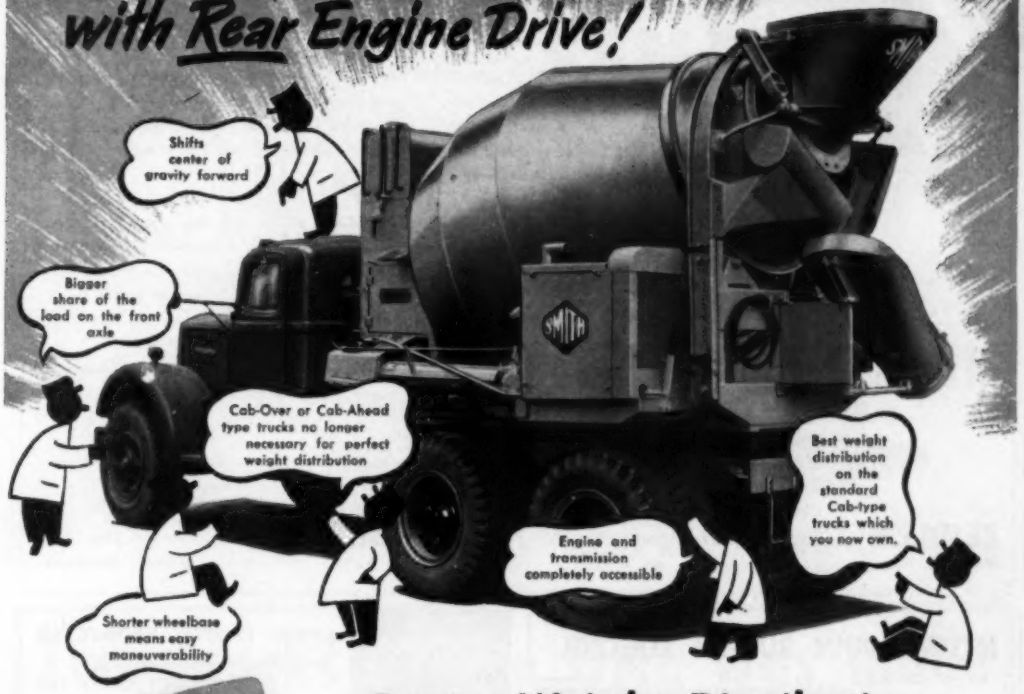
GENERAL ENGINES CO.
Dept. Q-82
307 Hunter St.
Gloucester, N. J.

New slump Brick used on home of Mr. & Mrs. Arnold Caputo; bricks by Plasticrete, Hamden, Conn.

GENERAL ENGINES CO.
DEPT. Q-82 — 307 HUNTER STREET, GLOUCESTER, N. J.

SMITH-MOBILE

with Rear Engine Drive!


Shifts center of gravity forward
Bigger share of the load on the front axle
Cab-Over or Cab-Ahead type trucks no longer necessary for perfect weight distribution
Shorter wheelbase means easy maneuverability
Engine and transmission completely accessible
Best weight distribution on the standard Cab-type trucks which you now own.
SMITH

Note the space saved on the truck because of rear-engine drive. This is a 5½ yard mixer in place of a 4½ front drive which formerly used all the space on this truck.

Better Weight Distribution . . . Means Bigger Legal Payloads

Are you looking for a truck mixer that will give you maximum legal payloads? Then be sure to investigate the new Smith-Mobile with REAR-ENGINE DRIVE. The engine has been moved from the front to the rear of the mixer, thereby reducing over-all length by over a foot and a half. Now you can move the mixer forward on the truck and thus move the center of gravity forward to put the proper share of the load on the front axle and relieve the rear axle. This means better weight distribution, greater payloads and more take-home dollars for the owner. You can now get the best weight distribution without using Cab-Over or Cab-Ahead type of trucks. Or, you can use a shorter wheelbase truck and get greater maneuverability. Use your present standard cab type trucks and still get perfect weight distribution.

Rear Engine Drive Smith-Mobiles are built in three standard sizes: 4½, 5½ and 6½ cubic yards, all bearing Truck Mixer Bureau rating plates. All of these new models have been job-tested and are backed by a company which has built nothing but mixers for 52 years.

The T. L. SMITH CO., 2887 N. 32nd St., Milwaukee 45, Wis. U. S. A.

SMITH
THE T. L. SMITH CO. MILWAUKEE, U.S.A.

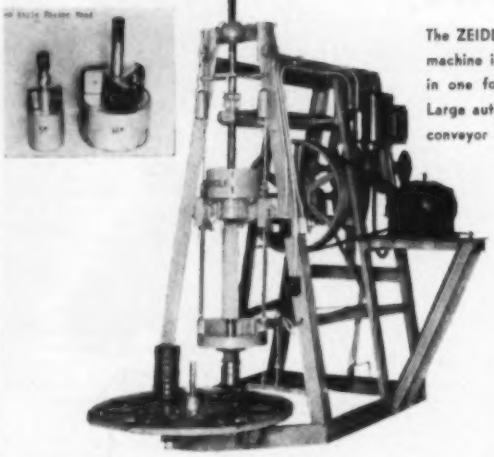
CONCRETE MIXERS

For BIGGER and BETTER Concrete Mixers and Truck Mixers . . . LOOK TO SMITH

ZEIDLER MACHINES HIGHER PRODUCTION AT LOWER COST

Thanks to BROM "NI-HARD"* CASTINGS

**Ni-Hard, trade mark registered U.S. Pat. Off.*



The ZEIDLER CONCRETE DRAIN TILE MACHINE is the pioneer production machine in this field . . . . produces 6 to 10 tile per minute, sizes 4" to 12" in one foot lengths. . . . Equipped with sturdy, long lasting forms. . . . Large automatic turn table for continuous production. Zeidler automatic feed conveyor also available.

★ ★ ★

The ZEIDLER PACKER HEAD (A), uses cheeks and rings furnished by the Brom Foundry & Machine Co., Winona, Minn., in Ni-Hard, the hardest and most wear-resistant cast metal. Ni-Hard outwears ordinary white iron 2 to 4 times. It has greater resistance to shock—cheeks are not easily broken from impact with rocks in plastic concrete. . . . Quality of castings is consistently high, with a minimum of grinding required, and no rejects.

★ ★ ★

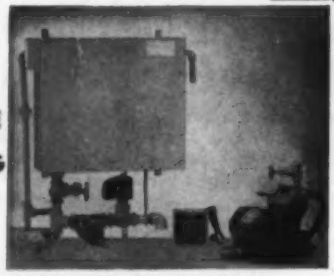
Zeidler also manufactures machines to produce concrete pipe in sizes up to 36" diameter and 6' lengths.

ZEIDLER *Concrete Products Machinery Co.*
Waterloo, Iowa

BROM *Foundry & Machine Co.*
Winona, Minnesota

NOW! PUSH BUTTON CONTROL

for
QUICK
ACCURATE
DISPENSING
of



CALCIUM CHLORIDE SOLUTION

With the Model C-I-L Dispenser illustrated above, calcium chloride solution can be pumped automatically from ground level to supply tank at batching level. The solution is then dispensed into water or sand by merely pushing the button on the control timing device. Other models for use with air entraining agents in solution operate in the same manner.

J-W Dispensers are shipped with weld pads and mounting brackets. The 13-gal. capacity welded steel supply tank, specially treated to handle calcium chloride solution, has mercoid switch and float and is shipped completely assembled and ready to install.

Write today for complete information and names of highly satisfied users.

J-W MATERIALS, INC.

P. O. BOX 288 NAPOLEON, OHIO
DISTRIBUTORS OF
DAREX AEA • DARASEAL • DARAKOTE • AIR METERS

LARGE PROFITS PRODUCING

Smoother, thicker, more uniform

MARVEL DRAIN TILE

The better tile — Better looking Better selling

Low cost, ruggedness, and dependability make the

MARVEL, JR.

CONCRETE DRAIN TILE MACHINE

a must in plants both large and small. The MARVEL JR. is famous for the smooth, symmetrical, full flat-ended tile it produces—a big selling feature and the reason why your customer prefers them over tile made on more expensive competitive machines. Write for detailed bulletin at once.

CONCRETE MACHINERY CO.
DRAWER 60A **HICKORY, N. C.**

Advertise Your

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Surplus Equipment

PENN-DIXIE CEMENT

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Two blocks where ONE was made

That's the output produced by this new

KENT *DUPLEX* BLOCKMAKER

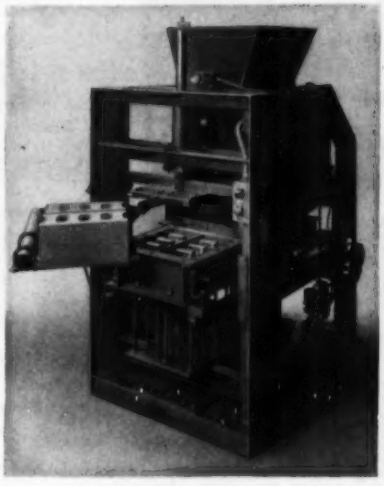
which was developed as a result of the consistent success and fine reception given the Kent Standard Blockmaker.

Both machines are similar in design and operation. Interchangeable mold boxes enable the Duplex to make *four* 4 x 8 x 16″, *two* 8 x 8 x 16″, *one* 10 x 8 x 16″ or *one* 12 x 8 x 16″ block per cycle, further increasing the many advantages incorporated in KENT Blockmakers.

The use of three rotary agitation shafts in the feed drawer assures positive feeding to the mold box and blocks of uniformly high quality.

The DUPLEX is available with manual swinging take-off as illustrated or front take-off for use with an air operated off-bearing hoist.

Get into bigger production and lower unit cost with this new KENT Duplex Blockmaker.



Write for information.

The **KENT MACHINE CO.** Cuyahoga Falls, Ohio — Concrete Products Machinery Since 1925

HEART OF A MODERN CONCRETE PIPE PLANT

Pipe-making operations in this huge plant of Lafayette Concrete Pipe Company of Lafayette, Louisiana, are *centered around a DIXON Model C Hydraulic Pipe Machine.*

With a five man crew, this machine produces over 3000' of pipe per 8 hours! That production, the low operating costs and overnight service on wearing parts are a few of the reasons so many DIXON Model C Machines are used in modern pipe plants all over the country.

For the complete story on the DIXON Model "C" Pipe Machine, write for a copy of our latest catalog.

HOUSTON CONCRETE MACHINERY CO.

Office and Mailing Address: 116 Heights Blvd. HOUSTON, TEXAS
Plant: 6600 Washington Ave.

CONCRETE Dixon MACHINERY

Manufacturers of:

Dixon Pipe Machines	Septic Tank Forms
Pipe Bend Machines	Dixon Conveyors
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YOU PACK YOUR BLOCKS With a GOCORP!

You don't drive a nail with a rubber hammer . . . nor can you get the best block compaction when pallet support depends on rubber or springs. GOCORP clamps the pallet to the mold . . . Vibrates the combination (pallet and mold) with sharp, swift sledge hammer blows . . . No cushioned deceleration common to other machines. Whiplike direction change at each end of the stroke means faster pickup during the stroke and a harder packing blow.

With GOCORP plain pallet machines . . . the King—6 at a time . . . the Senior (illustrated)—3 at a time . . . the Prince—2 at a time . . . You also get:

- **100% Hydraulic Operation**—adjust any operation without affecting others.
- **Main Hopper Feed** — no old fashioned feed drawer.
- **One Man Operation**—reduces labor cost.
- **Front Pallet Feed**—saves space, reverses pallet each time used.
- **The BEST in service.**
- **Other GoCorp Equipment**—Junior Cored Pallet Block Machines . . . Batch Mixers . . . Pipe and Tile Machines.

THE GENE OLSEN CORP.

403 Grace St. Adrian, Mich. Phone 2120

To convert from dry batch to Central Mix, for a package central mix plant, or a semi-portable plant, write: SuPREMIX, Incorporated (an affiliate of GoCorp), 401 Grace Street, Adrian Michigan.

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Sells Your Products... Increases Your Profits!

Equipped with the Forney Direct Reading Gauge

● If you manufacture Concrete — *you* need a FORNEY Compression Tester.

Producers of Concrete building units, concrete products or concrete in any form will find that daily tests can substantially increase yields. Such variables as cement content, aggregate, mixing, curing, molding and segregation can be controlled.

Daily Testing creates customer confidence in your products.

Write For Full Information

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...“all set” to hit record *block profits*

after installing

OSWALT SERVICE

GET THE FACTS
Write for your copy of new Booklet:
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You can keep up a high “batting average” in your block production by using Oswalt Service to insure High-Speed Production of your present vibrapac machine without sacrifice of quality.

Contact the nearest Oswalt-serviced plant . . . (Send for our list) . . . and ask the owner about the advantages of his Oswalt-serviced vibra-pac.

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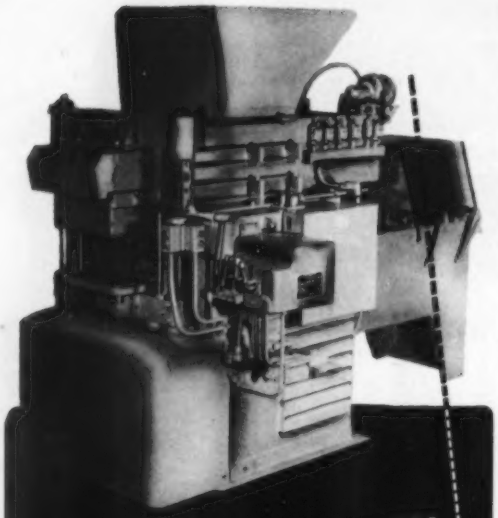
Write for name of your nearest Oswalt-Serviced plant

OSWALT ENGINEERING SERVICE CORP.
1335 Circle Avenue, Forest Park, Illinois **Phones: EStebrook 8-3666 — FOrest 6-3898**



Columbia BLOCK MACHINES "LEAD the FIELD"

...IN LOW INITIAL COST... HIGH PRODUCTION AND ECONOMY OF OPERATION

FROM COAST-TO-COAST, operators find the Columbia line a leader in its field! Its compact, rugged construction assures longer performance under most severe operating conditions ...moving, rotary parts are made with needle bearings, hardened pins and enclosed within the machine for protection from grit.

COLUMBIA'S 100% oil hydraulic, fingertip controls and automatic pallet feeder offer higher production capacities and utmost economy. Its flexible operation—from fully automatic to manual in a flip of a switch—is an advantage when changing molds or starting or ending a shift.

THE COLUMBIA IS SIMPLE IN DESIGN and produces precision, modular blocks from over 200 different types of molds and uses either light or heavy weight aggregate. Parts are standard. Steel or wood pallets may be used. Dollar for dollar—the finest machine on the market today! Write for complete details.

SALES AND SERVICE THROUGHOUT U. S. AND CANADA

There is a Representative in Your Area
Write for Name and Address

Columbia MACHINE WORKS

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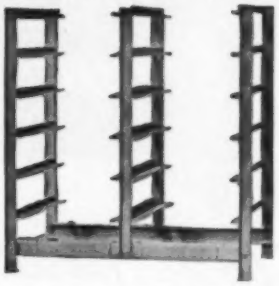
CHASE BLOCK RACKS, CARS, PALLETS

Corrosion-Resistant Hi-Strength Alloy Steel



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- *DURABILITY*
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Sturdy construction • any style or capacity • Shipped knocked down • Rigid Field connections • assembled Easily

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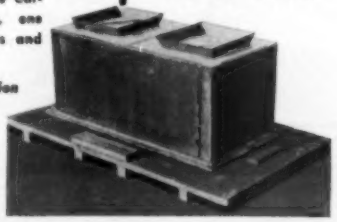
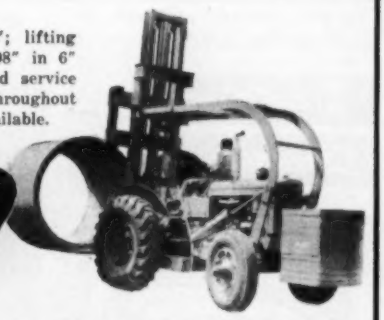


New Tracto-Lift Model Ready for Heaviest Jobs

Three giant-size Tracto-Lift models are now available in the rugged, new POWER KING series. The basic Tracto-Lift feature of over-size pneumatic tires that give maximum traction and the ability to operate even on rough, unpaved ground, has been incorporated into a fork lift with amazing work capacity and power. Has wide range of speeds—6 forward and 6 reverse speeds. Utilize wasted outside storage space, handle bulky, heavy materials, of ALL KINDS easily by employing POWER KING!

POWER KING FACTS: Lifting height, 10'-25'; lifting capacities, 10,000-15,000 lbs.; fork lengths, 36"-108" in 6" variations. Climbs inclines up to 20%. Parts and service for standard industrial tractor unit available throughout world. Complete line of versatile attachments available.



TRACTO-LIFT Company
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Write today for complete specifications and illustrated folder on Tracto-Lift's new POWER KING Models No. MU-100, MU-125 and MU-150.

TAKE STEPS *NOW*
to make
LARGE PROFITS
from a SMALL INVESTMENT
PATENTED
Pre-cast Concrete Steps

These easy-to-make, attractive steps find a ready market everywhere.
DON'T WAIT — INVESTIGATE!
A Real Business — Not a Side Line
Exclusive Territories available — Write for details.

PITTSBURGH PRE-CAST CO.
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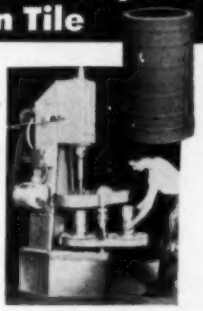
Make Money with *Champion* Cement Drain Tile



More millions of drain tile are needed to supply ever growing demand. The market is broad and profits are big.

The Champion makes the world's best drain tile. Densely compacted . . . ribbed for extra strength . . . every one truly concentric.

Champion machine is simple, compact and really rugged. Automatic feeder (optional) makes for 1-man operation. Write for literature—gives facts about the business and the equipment.

Concrete Equipment Co.
532 Ottawa Ave., Holland, Mich.

Meeting Load Limitations *with* High Capacity at LOW COST!

Hi-LO TRUCK MIXER

Ask the Fleet Owners.
Names on Request.

HI-LO Jr. and HI-LO Models

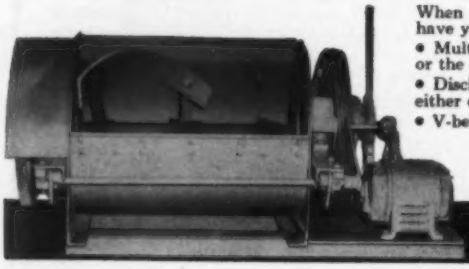
HI-LO Jr. ***with VISIBLE MIXING***

Carries up to 3 cu. yds. of mixed concrete on a single axle truck . . . and not exceed the single axle weight limitation of 18,000 pounds which prevails in many states.

NEW BULLETIN MAILED ON REQUEST

CONCRETE TRANSPORT MIXER CO.
Phone Flanders 7800
4989 FYLER AVE. • ST. LOUIS 9, MO.
Serving the CONCRETE INDUSTRY 20 YEARS

only MULTI-MIXER gives you a choice!



When you buy Multi-Mixer you have your choice of:

- Multi-blade paddle arrangement or the conventional spiral blades.
- Discharge door in the rear or either end, controlled front or rear.
- V-belt drive or direct drive motor, and right or left hand drive.
- Special grill guards and dust proof covers.
- Rigid stationary mounting or portable mounting.

All Multi-Mixers are of welded steel construction, in standard sizes from 3 to 60 cu. ft., and larger sizes to your specifications. Ask for Bulletin MM-11. Multiplex also makes fully automatic block machines, skip loaders, and compartment aggregate bins.

MULTIPLEX Machinery Corp • Elmore, Ohio

Better concrete building units can be made on the best steel pallets. Your units will test higher, be more uniformly sized and have sharper edges when produced on "COMMERCIAL" CLOSE CLEARANCE STEEL PALLETS.

THE COMMERCIAL SHEARING AND STAMPING COMPANY
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Hundreds of leading plants from coast to coast have proven *under actual operating conditions* that Lith-I-Block leads the way. In consistent, day after day production, it builds sales and output while it cuts operating costs.

Write for the Lith-I-Block story and the names of nearby Lith-I-Block producers.

LITH-I-BAR
LITH-I-BLOCK
LITH-A-TEX

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All-welded ELEVATOR BUCKETS

light • durable • quick cleaning

For maximum elevator capacity with minimum h.p. requirements, use Johnson cement and aggregate buckets. All-*welded* steel, with heavy-gauge lips and ends, they're light, durable, smooth for fast filling, quick cleaning. Three sizes cement: 10x6", 12x7", 14x8" . . . 4 aggregate: 10x6", 12x8", 14x8", 16x8".

Long-life steel chain has carburized steel knuckles, medium carbon steel side bars, welded bucket lugs, alloy heat-treated ⅝" pins. You'll find that carburized steel parts last longer than malleable iron.

Mail to C. S. JOHNSON CO. Champaign, Ill. *(Koehring Subsidiary)*

Send information on: ☐ buckets ☐ elevator chain for _____ (type of material)

NAME _____ CO. _____
STREET _____
CITY, STATE _____ J2431PO

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with the

APPLEY *Little Giant*
Slump Brick and Slump Block Machine

Modern, vibration-type machine, featuring interchangeable mold and plain pallet-rack. Makes 6 to 15 slump bricks or blocks per cycle, in many shapes and colors. Lengths of units, 8", 12" and 16". Thicknesses from ⅝" to 4". Units applicable to commercial and residential construction. Write for literature.

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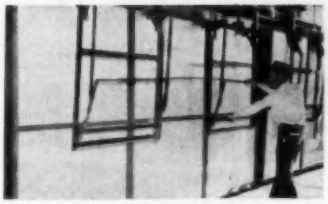
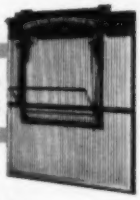


Universal Door and Carrier equipment in use at Superior Concrete Products Co., Augusta, Ga.

● Can help you cut your cost per block and improve your quality-uniformity—by stopping costly losses of heat and steam—and preserving uniform temperature and humidity. Two *very* good reasons for you to investigate

UNI-TEMP insulated all-metal DOORS* & UNIVERSAL world-famous DOOR CARRIERS

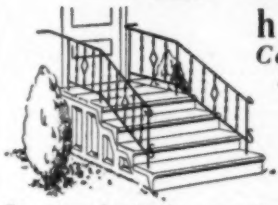


**Doors also furnished hinge-mounted.*

Let us give you full information about the most efficient kiln closure equipment you've ever seen—at a cost that is probably *much* less then you expect!

Write, wire or phone: **UNIVERSAL DOOR CARRIER, Inc.**
1117 Cornell Avenue
Indianapolis 2, Indiana

NOW MORE THAN 120 LICENSED MANUFACTURERS Producing



Patented
homeward *Concrete* **STEPS**

A Small Investment That Pays Big Dividends

Homeward all metal forms are precision built to produce a product that requires no hand finishing.

The exclusive franchise for your territory may still be open

For Complete Information Write
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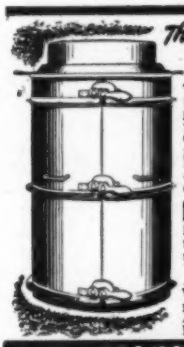

The "Quinn Standard" FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that **Quinn pipe forms** and **Quinn mixing formulas** combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from "0" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request. Also manufacturers QUINN CONCRETE PIPE MACHINES.

QUINN WIRE & IRON WORKS 1627 12TH ST. BOONE, IOWA

WEAR 5 TO 10 TIMES LONGER
because they're job-fitted

for handling bagged cement, other smooth or slippery materials — wet or dry

Grab-it sure-gripping gloves, coated with tough, non-skid natural rubber: Job-fitted for faster, safer load handling. Outwear ordinary canvas or leather by several times. Knit-wrist, safety cuff or gauntlet, fully coated or palm-coated.

for handling concrete block, other abrasive or oily work

Monkey-Grip gloves, coated with permanently flexible plastic: Specially resistant to abrasion. Far outlast ordinary plastic gloves because the permanently flexible coating will not crack or peel. Knitwrist, band-top or gauntlet, fully coated or palm-coated.

Free Test Offer: Employers, send brief description, on business letterhead, of your operation and materials handled. Without charge, we will forward samples of type gloves we recommend, for on-the-job test. Address

Edmont JOB-FITTED GLOVES

Edmont Manufacturing Company
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World's largest maker of coated industrial gloves

BESLITE
MARIETTA

You need BOTH for BETTER concrete products

BESLITE

Here's the superior lightweight aggregate . . . gives new beauty, greater durability and excellent heat and sound insulating properties to all your structural and precast concrete products. Reduces weight by ⅓ without reducing strength! Available in two sizes—⅓" to #4, and minus #4, by truck, rail or barge within 300 mile radius of Marietta plant.

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Modern MARIETTA concrete storage tanks are made with BESLITE for permanency . . . protect your bulk materials against fire, air, moisture and the elements. You pick the size and arrangement, MARIETTA quickly erects your complete system to meet your present and future storage plans.

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MARIETTA, OHIO

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THE *Valor* MASONRY SAW

For
MORE PROFIT PER CUT!

- ★PRICED LOWER
- ★CUTS WET OR DRY
- ★CUTS ALL MASONRY MATERIALS
- ★IT'S PORTABLE, ONLY 225 LBS.
- ★SAFE AND EASY TO OPERATE

THERE'S A VALOR FOR EVERY PURSE AND PURPOSE

Built for Speed, Economy and Accuracy, the VALOR is the greatest value in masonry saws today . . . its light weight, plus 9 second head removal, make it really portable. The Feedmatic principle automatically controls blade pressure. The long head-throw eliminates the need for changing head positions for varying material heights. The rugged tube and ¼" angle construction is backed by dual foot pedal springs, wobble-proof cart, trouble free self-priming pump and cadmium plated parts.

SEE YOUR DEALER TODAY!

Victor ENGINEERING CORPORATION

27 Maplewood Ave., Philadelphia 44, Pa.

SAVE YOUR STEAM!

"Standard DOORS
are really doing a swell job . . ."
says ARTHUR MILLER, JR.
FOSTORIA CONCRETE PRODUCTS, FOSTORIA, OHIO

"I am very well pleased with the curing operation and at this time want to thank you for your time and the courtesy you extended to our company," Mr. Miller wrote.

Naturally we like to get a letter like that—and we invite you to SAVE STEAM too, the Standard door way! Made of corrosion-resistant aluminum metal, Standard dryer doors stand up under severest heat and high humidity conditions . . . feature vapor-sealed insulation between heavy-duty gauge aluminum sheets for maximum fuel savings.

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Another Leader

IN THE PRODUCTS INDUSTRY PREFERS BESSER VIBRAPACS

"We Checked All Other Machines and Decided Besser was the Most Efficient of All"... M. A. Moss

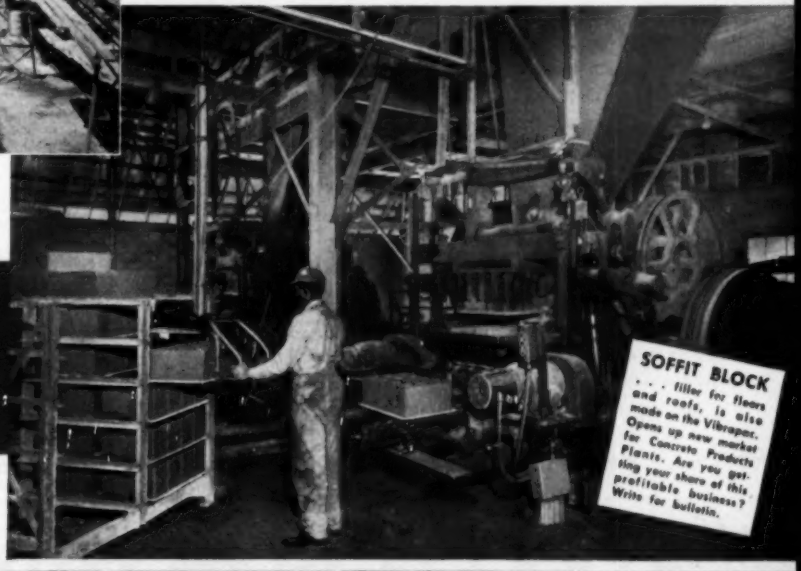
John A. Denie's Sons Company, Memphis, Tenn., is one of the oldest building material dealers in the south. The firm established its clay brick plant about 97 years ago and has been manufacturing brick ever since. They use the rather catchy slogan "We Sold Your Great Grandfather".

In 1945, the Denie's Sons Company installed their first Besser Super Vibrapac machine. This was followed by another Super Vibrapac in 1948. These two machines are used for producing both sand and gravel block and lightweight units sold in conjunction with their face brick. That officials of the company were very careful in selecting the right type of equipment is reflected in Mr. M. A. Moss' statement shown above.

Here is another example of a progressive clay brick plant which has found the combination of brick and block a profitable investment.

BESSER MANUFACTURING COMPANY
ALPENA, MICHIGAN, U.S.A.

Exterior view of the John A. Denie's Sons Co. plant showing modern material handling equipment.



SOFFIT BLOCK . . . filler for floors and roofs, is also made on the Vibrapac. Opens up new market for Concrete Products Plants. Are you getting your share of this profitable business? Write for bulletin.

★ This is the 96th of a series of ads featuring leaders of the Concrete Products Industry who are stepping up block production with Besser Vibrapac machines.

BESSER

BATCH MIXERS | SKIP LOADERS | BLOCK & BRICK CUBERS | SUPER VIBRAPAC | SINTERING PLANTS | ACROW CENTERS | ROOF TILE MACHINE

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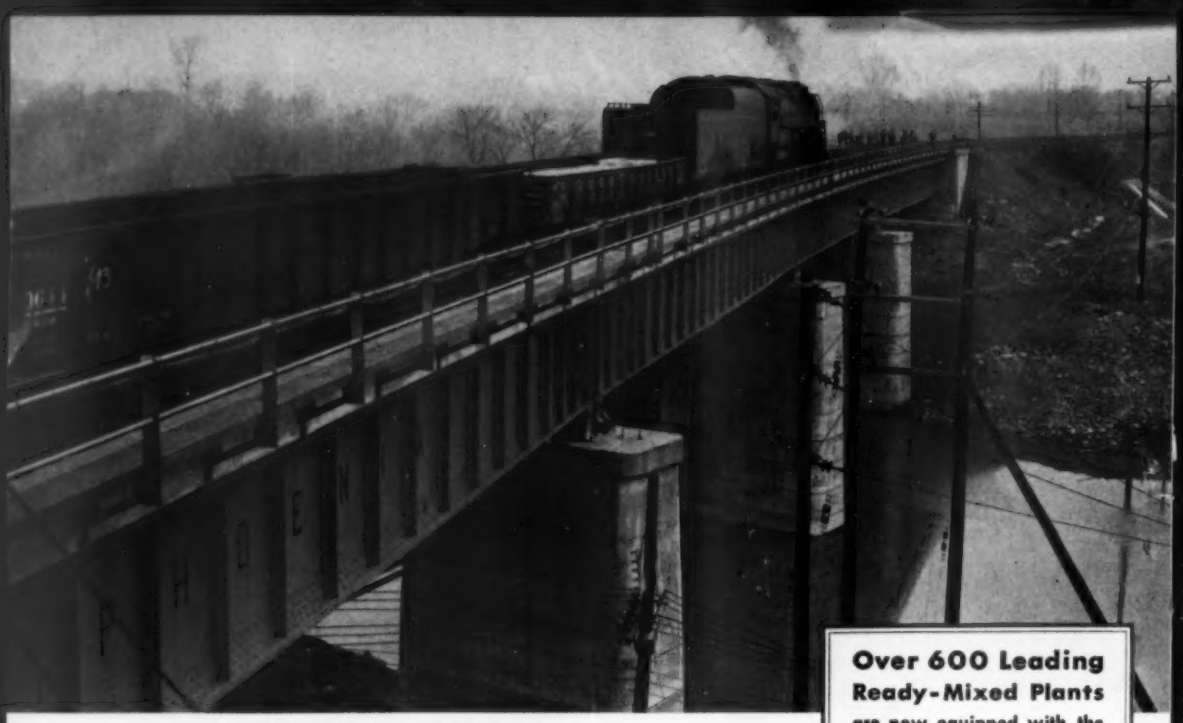

Reading Railroad Co. Bridge, Glenside, Pa. Engr.—Reading Co.; Contr.—Bates & Rogers, Chicago; Pozzolith Ready-Mixed Concrete supplied by Reading Ready Mix Co.

POZZOLITH BETTER CONCRETE In Reading Railroad Bridge

Better performance *during* construction . . . better performance *after* the job is completed . . . is standard with Pozzolith Concrete and accounts for its wide use in such important structures as this Reading Railroad Co. half million dollar belt line bridge.

CONSTRUCTION advantages of Pozzolith Concrete include — easy placeability, good cohesiveness, reduced bleeding, designed strength, good bond of concrete to steel, reduced shrinkage and minimum finishing.

SERVICE advantages are — good appearance, low permeability, minimum volume change, great durability, and maintenance economy.

POZZOLITH provides these benefits — *at lower cost than by any other means* — because it disperses cement, reduces water and entrains the optimum amount of air. *Full information and literature on request.*

Over 600 Leading Ready-Mixed Plants are now equipped with the POZZOLITH AUTOMATIC DISPENSER

WHY?

Because a producer can, at lower cost:

1. Produce concrete of low permeability . . . with normal Portland cement.
2. Produce high-early strength concrete . . . with normal Portland cement.
3. Produce air entrained concrete without strength loss . . . with normal Portland cement.
4. Produce all of the above properties out of one cement bin . . . with normal Portland cement — stepping up production, reducing inconvenience in handling and cutting costs.

•

In normal mixes, concrete of any given durability, strength and workability, is produced more economically with Pozzolith than by any other means.

Over 600 Leading Ready-Mix Plants
Are Producing Pozzolith Ready-Mixed Concrete
(Names Of Your Nearby Producers Supplied Upon Request)

the MASTER BUILDERS Co.

CLEVELAND 3, OHIO — Subsidiary of American-Marietta Company — TORONTO, ONTARIO

BROADCAST and SECTION

PIT AND QUARRY • 431 S. DEARBORN ST. • CHICAGO 5, ILL.

ADVERTISING RATE PER ISSUE: $8 A COLUMN INCH. LOWER RATES FOR LARGER SPACE USED AND/OR ON A CONTRACT BASIS. WRITE FOR RATE CARD.

CLOSING DATE: 20th OF THE MONTH PRECEDING DATE OF PUBLICATION

[Additional Classified Ads on Pages 194, 195]

Royal E. Burnham

Attorney at Law

Patent and Trade-Mark Causes

3201 Tennyson Street, N. W.
WASHINGTON 15, D. C.

CORE DRILLING ANYWHERE
We look into the earth
PENNSYLVANIA DRILLING COMPANY
PITTSBURGH 20, PA.

WANTED

COMPETENT SUPERINTENDENT

for old established colored Marble Quarry on eastern seaboard. Exceptional opportunity for good man to become Manager.

Box R-3, Pit and Quarry
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Chicago 5, Ill.

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A minimum of five years' experience required in the manufacture of Portland cement. Age 30-40. College degree in chemical or mechanical engineering desired, but equivalent experience will be considered. Excellent hospitalization, surgical and life insurance and pension plan. Plant located in Michigan. Please give all details in first letter.

Box No. M-6, c/o Pit and Quarry Publications
431 S. Dearborn St. Chicago 5, Ill.

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Box No. R-5, c/o Pit and Quarry
431 S. Dearborn Street, Chicago 5, Illinois

Quarries
Crushing Plants
Cement Plants
Storage Methods
Operating Costs

E. Lee Heidenreich, Jr.

Consulting Engineer

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Newburgh, N. Y.
Phone: 1828

9 South Clinton St.
Chicago 6, Ill.
Ph. FR 2-4186

Operation
Plant Layout
Design
Construction
Appraisals

WANTED

To Expedite Production—Rock Products Equipment including Rotary Dryers, Kilns, Crushers, Bins, Ball Mills, Vibrating Screens, Filters, Power Shovels & Cranes, Conveyors, Diesel Engines. Will consider a set up plant now operating or shut down. When offering give full particulars.

P. O. Box 1351, Church Str. Sta.
New York 8, N. Y.

SALES REPRESENTATIVE WANTED

Old-established manufacturer of process equipment has opening for qualified man to contact cement and chemical plants. Knowledge of these industries necessary. Prefer man with engineering background and actual experience in cement field. Excellent opportunity for advancement. State full details including salary. Your reply will be held in strict confidence. Our employees know of this advertisement.

BOX NO. S-5, c/o Pit and Quarry Publications
431 South Dearborn Street Chicago 5, Illinois

WANTED

24" gauge locomotive, gasoline engine, small, about 3 ton, good condition.

H. KLEINHANS COMPANY
Union Trust Bldg., Pittsburgh, Pa.

WANTED TO BUY

COMPLETE PLANTS FOR LIQUIDATION

Complete plants for liquidation, equipment, machinery, structural steel, pipe, and tonnages of scrap iron.

M. WEBER
Box 1985 Chattanooga, Tennessee

WANTED TO BUY

Block Assembly for D-6 Caterpillar Tractor, 3 Cylinder Model.
Write, wire, phone:

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1180 Beck Street
Salt Lake City, Utah
Phone 3-5675

WANTED

Manager for quarry operation, established for 25 years. Good salary and promotion. Must know all phases of complete quarry operations, including production and sales.

BOX NO. R-2, c/o Pit and Quarry Publications
431 S. Dearborn St. Chicago 29, Illinois

CHIEF CHEMIST Wanted by CEMENT PLANT

Located on Texas Gulf Coast. Must be qualified by training and experience.

State age, experience, references and salary expected.

BOX R-4, c/o PIT AND QUARRY
431 S. Dearborn St., Chicago 5, Ill.

WANTED

Competent Superintendent

for Old Established Midwestern High Calcium Lime Plant & Quarry Operation

Box No. S-14, Pit & Quarry
431 S. Dearborn Street
Chicago 5, Illinois

POSITION WANTED
—Manager—Superintendent—

25 years experience Construction—Operation—Maintenance—Rock Products—Limestone—Cement—Clay—Feldspar Plants—Including Dredging—Open Pit and Tunnel Quarry Operation. Prefer South—Available on Short Notice.

Box NO. S-3, c/o Pit and Quarry Publications
431 South Dearborn St. Chicago 5, Illinois

INORGANIC ANALYTICAL CHEMIST, M.S. phys. chem., 32, 8 years chief chemist in Portland cement dry plant, strong engineering background, also research and teaching experience, languages; Spanish, German; married, desires responsible position. Location immaterial.

BOX NO. S-15, c/o PIT AND QUARRY
431 S. DEARBORN ST., CHICAGO 5, ILLINOIS

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Interested in buying small limestone quarry to produce Agstone and road or commercial stone. Should be complete with operating equipment and in fair market area.

BOX NO. S-6, c/o Pit and Quarry Publications
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NOW LIQUIDATING COMPLETE LIME PLANT

located near Medford, Oregon. Most equipment . . . new and unused . . . to be sold "where is . . . as is" as a complete plant or any part!

1—ROTARY KILN 7½' x 106', newly lined with fire bricks. Never used, O.A. length with dust chamber, etc., approx. 120'; new cyclone and dust chamber newly lined with brick, never used. Complete with instruments and spare parts.

1—HYDRATE PLANT, Mfg. by N. J. Kuntz, complete with elevators, cyclones, storage tanks, capacity 2½ tons per hour.

1—HYDRATE PULVERIZER, mfg. by Lime Plant & Equipment Company.

1—CRUSHER, Kue-Ken, size 70.

1—ROLLER MILL, Raymond, 4 roller, low side, with No. 11 special exhaust fan.

1—HAMMER MILL, Williams, with bucket elevator, enclosed.

1—ROCK CRUSHER, (grinder) Pulverizer, Bassett. Model UX, Type A, size 3.

1—ROTARY DRYER, Barber-Greene, 4' x 30', with rollers, stands, chain drive.

• ***Numerous other items including***

large steel bulk storage tanks, belt conveyor grizzly, bunkers, miscellaneous electric motors, fans, etc.

ZIDELL MACHINERY & SUPPLY CO.

3121 S. W. Moody St., Portland, Ore. • AT 8691

FOR SALE

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1—Plymouth 14 Ton Std.—or 48" Ga., Diesel.
1—Brookville 10 Ton Diesel—36" Ga. Like New
3—Whitcomb 15 Ton Diesel—36" Ga.
1—Plymouth 20 Ton Gas—36" Ga.
2—Plymouth 25 Ton—36" Ga., Gas.
2—G. E. 45 Ton—Diesel-Elec.
1—G. E. 70 Ton Diesel-Elec.

WHITCOMB 50 TON STD. GA. DIESEL-ELECTRIC—TYPE 0-4-0—EXCELLENT—BARGAIN

CARS

21—15 Ton Hopper—36" Ga.
2—50 Ton Hopper Cars—Excellent.
25—Std. Ga.—8 Yd.—Quarry Cars. Heavy Duty.
10—Western 20 YD Air Dump.

MISCELLANEOUS

1—American—Mod. 2036—Stiff Leg—New—Bargain. 30 Ton @ 48'.
2—Conway 15 Muckers—#256 & 305. Large Number New Repair Parts.
1—100 Ton Stiff Leg.
3—Koehring WD-60 Dumptors—2500 Series.

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Phone SA. 2-7132

SPECIAL BARGAINS

Marion "Model 331" Crawler Gas Crane, Dragline and Backhoe, cap. ¾ yd.

General "Model 307" Crawler Diesel Crane, cap. ¾ yd., boom 40'.

The above overhauled and ready for work.

THE ACME EQUIPMENT COMPANY
14057 Schaefer Highway
Detroit 27, Mich. VErmont 7-0366

FOR VALUES— "BUY BRILL"

1—Williams 4-roll "Standard" high side mill.
2—Raymond 4-roll high side mills.
4—Rotary Kilns 7½'x260', 7'x120', 6'x60', and 4'x35'.
6—Rotary Dryers 10'x90', 7'x120', 5'x67', 5'x40', 4'6"x40', 3'x22'.
2—Jeffrey Hammer Mills 36"x24", 24"x12".
1—Jeffrey Waytrol Feeder Type 118.
1—Jeffrey 30"x78" Double Surface Screen.
6—Tyler Hummer Screens 4'x7' and 3'x5'.
1—Farrell 20"x10" Type B Jaw Crusher.
2—Sturtevant 30"x16", 30"x12" Double Roll Crushers.
1—Steel Bin 15'x25'x9' deep.
8—Bucket Elevators 34' to 90' centers, 8"x5" to 24"x8" buckets, steel enclosed.

PARTIAL LIST
Send for News Flash

BRILL EQUIPMENT COMPANY
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Tel.: Cypress 2-5703

FOR SALE

1—Austin Western "Badger" Crane, 20' Boom, 4-Ton, Gas, Dr., Crawler Mtd.
1—Caterpillar D4 Diesel Tractor with Trackson T4 Shovel Loader, Digger, and Bulldozer Attachments.
2—Universal Truck Cranes, 25' Boom, mtd. on Mack AC Truck, pneum. tires, dual rear.
2—Rex Gas. Dr. Port. Pumps, 4" pneum. tires.
2—30 Ton All Steel Stiff Leg Derricks, 65' boom, with or without Hoisting Engine.
2—Three Drum Hoisting Engines, Lambert, with attached Swingers 10,000 lb. SLP, with 100 HP Waukesha Gas Engines. (Can furnish as Elec. or Diesel Dr.)
1—General Model 200 Back Hoe, gas dr., crawler mtd., ½ Yd.

CONSTRUCTION & POWER MACHINERY, INC.
270—23d Street, Brooklyn 15, N. Y.
South 8-4900

FOR SALE

65 Ton G.E. Diesel Elec. Loco.
7 Caterpillar DW10 Tractor-Wagons
30 Ton Amer. Steel Stiffleg Derrick
130 HP Christian 2d Diesel Hoist
30 Ton Ind. Bh. Gas Loco. Crane
30 Ton Davenport Diesel Loco.
1050 ft. I-R Air Compressor, New '49
48" Telsmith Gyrasphere Crusher
556 KW F-M Diesel Generator Set
10 Koppel 5 yd. Steel Dump Cars

MISSISSIPPI VALLEY EQUIPMENT CO.
513 Locust St. St. Louis 1, Mo.

CRUSHING PLANT *Complete*

Farrel-Bacon jaw crusher 15" x 36" with 50 h.p. Westinghouse motor with controls — Feeder — 24" — 120' conveyor with new belt powered by 10 h.p. G.E. motor and speed reducer. Pioneer shaker screen 4' x 12' with 15 h.p. G.E. motor—4 bins—60,000 lb. Fairbanks scale. To be sold as one unit. Erected new in 1947. Crushing capacity of 80 to 100 tons per hour.

JOHN de SOUSA
Box 177 Riegelsville, Bucks Co., Pa.

Euclid Trucks 15 Ton—22 ton End Dump—15 Yd. and 25 Yd. Bottom Dumps—12—25 Yd. Bottom Dump without tractors.

4—Elec. Std. Ga. Dump Car locomotives—600 volt with 17—std. ga. air dump cars—25,000 lb. cap. 130 Cu. Ft. level, with all elec. equip. Goodman 10 Ton Mine Loco—250 Volt 36" Gauge. Grumman Mine Hoist—1¼" Rope—200 H.P. Motor—825 RPM. complete.

Jaw Crushers 36" x 48" Nordberg—36" x 48" Farrel—60" x 48"—42" x 40"—42" x 30"—24" x 36"—18" x 36"—15" x 36" Symons Cone 5½'—4'—3'—2'—50 x 60 Dixie hammer mill—54" Traylor Type "—42" McCully—48" Gyrosphere.

Shovels—Ball Crushers—Rod Mills—Ball Mills—Rotary Kilns—Dryers—Log Washers—Classifier—Mine Hoists—Transformers—Motors—Gravel Plants—Blast Hole Drills—27T-29T-42T Generator Sets—Drag Lines.

2—25' A.C. Log Washers

STANLEY B. TROYER
Theatre Bldg. Tel. 500 Crosby, Minnesota

DEPENDABLE USED MACHINES

Special—20"x40' portable belt conveyor rebuilt with all new troughing idlers.

Lorain 40 shovel
Hannon truck crane
P&H ½ yd. crane
1½ Std. Page bucket
Pioneer 4x8 screen
Cedar Rapids 15x36 jaw crusher
Gruendler 10x36 jaw crusher
New Pioneer 18"x100' conveyor
Morris 10" manganese gravel pump
Robins 20" belt tripper
3 yd. Dumpcrete
Eagle cinder crusher
3x12 revolving screen
Falcon 6" pump
Climax R-61 engine

These machines reconditioned in our newly-built daylight plant. Come see them!

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CONVEYOR BELT

Conveyor Belt Goodyear Style 6749. Size 51" wide, ½" thick x 234 ft. endless treated with Neoprene, will stand up to 400 degrees heat. New price $4000.00. OUR PRICE $2000.00. This belt never used.

H. L. HARVEY
207 NE 21st St., Fort Worth, Texas

L.B.SMITH INC. OFFERS

QUARRY EQUIPMENT & BINS

4024 Cedarapids roll, rebuilt.
Cedarapids Rock-It plant with 2025 jaw, 3033 mill, new.
3018 Cedarapids roll, rebuilt.
1030 Good Roads. Reconditioned.
36" x 14' apron feeder, rebuilt.
1236 Cedarapids Model 6C plant, new.
4033 Cedarapids hammermill, rebuilt.
36" x 14' apron feeder, rebuilt.
10 x 7 Allis Chalmers Blake type jaw crusher.
#1 Cedarapids Kubit impact breaker.
15 cu. yd. Cedarapids sand drag, new.
8' x 18' two-compartment 60-ton storage bin.
10' x 10' single compartment storage bin.
13' x 23' two-compartment 100-ton storage bin.
3' x 6' Kennedy Van Saun triple deck.
4' x 6' Kennedy Van Saun single deck.
16" x 90' bucket elevator.

GENERATORS & LIGHT PLANTS

1½ KW to 125 KW, alternating and direct current, gasoline and diesel powered.

SHOVELS & CRANES

Lorain L-50, 1-yd. diesel. New condition.
Brownhoist 1-yd. gas shovel & crane.
P&H 150 gas crane.

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2—45" Ohio lifting magnets, rebuilt.
1—36" ECM lifting magnet, rebuilt.

MISCELLANEOUS

Barber-Greene 44C Trenching Machine.
Austin Western 77 tandem drive grader, 12' blade, scarifier.
½-yd. to 2-yd. clamshell buckets.
½-yd. to 5-yd. dragline buckets.
6-yd. and 12-yd. Sauerman buckets.

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1½-ton Ford with any body.
LeTourneau tractor w/16 yd. Tournarocker, rebuilt.
2,000 gallon tanks on semi-trailer mounting.
New and rebuilt dump bodies.

BELT CONVEYORS & BELT

New 18" — 24" — 30" — 36"

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Sanderson-Cyclone #42 well drill, new.
Sanderson-Cyclone #44 well drill, new.

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Murphy ME-46 rebuilt.
GMC 6 and 12 cylinder. Practically new.
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Gardner-Denver 500 cu. ft. diesel, rebuilt.
Schramm 105 cu. ft. gas powered compressor on 4 steel wheels.
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Worthington two-stage, water cooled, vertical 250#, 60 CFM, new condition.

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L.B.SMITH INC. CAMP HILL, PA. SUBURB OF HARRISBURG

WE OWN THE EQUIPMENT WE ADVERTISE

FOR SALE

while it lasts—Surplus new Pioneer belts any length up to 500 ft.

12 inch—6 ply 36 oz. duck ⅛ x 1/32 cover elevator belts. List $5.00—Price $3.70 per ft.

20 inch—4 ply conveyor belt—28 oz.—⅛ x 1/32 cover. List $5.26—Price $4.00 per ft.

24 inch—4 ply conveyor belt—28 oz.—⅛ x 1/32 cover. List $6.18—Price $4.75 per ft.

24 inch—5 ply conveyor belt—28 oz. ⅛ x 1/32 cover. List $7.24—Price $5.45 per ft.

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JERSEYVILLE, ILLINOIS

FOR SALE

1—Huber Tractor W/Sheepsfoot Roller Wheels Model 4062
1—Electrifugal Pump, Size 514, Type SS-1
1—2 Yard Dragline Bucket
1—3 Yard Dump Bed
1—7' x 12" Flat Bed Steel Sides—Wood Floor
1—Adnun Paver, Ser. #241
1—Westinghouse Elec. Furnace, Type H-36, Ser. #20P851, Max. Temp. 1850, Size 20x12x40
1—Westinghouse Elec. Furnace, Basket Type, Type AF2524, Ser. #21P587

RALPH ROGERS & CO., INC.
720 Argyle Avenue — Nashville, Tennessee

ELECTRIC MOTORS FOR SALE

1—Westinghouse 150 HP, 3 PH, 60 Cycle 220/440V 860 RPM Drip Proof.
1—G.E. 30 HP, 230V DC 775 RPM.
1—Allis Chalmers 30 HP, 3 PH, 220/440V 1160 RPM.
1—G.E. 25 HP, 440V 3 PH, 850 RPM.
1—Allis Chalmers 15 HP, 220V 3PH, 3450 RPM.

DIAMOND SUPPLY CO., INC.
Evansville, Indiana
Phone 4-8275

MINE AND SLOPE HOISTS

1—20,000# Allis-Chalmers, Dbl Drum
1—26,000# Nordberg, Sgl Drum
1—26,000# Vulcan, Sgl Drum AC with MG Set Complete
1—11,000# Wellman, Sgl Drum AC
1—16,000# Allis-Chalmers, Sgl Drum
1— 7,000# Ottumwa, Sgl Drum AC

CARPULLERS AND LOADERS

1— 5,000# Jeffrey Carspotter AC
1— 4,000# Brownie Carspotter AC
1— 5,000# Link-Belt Carspotter AC
1—20,000# Amer. Hoist Carspotter AC
1—20,000# LB Endless Puller

CRUSHERS & MISC.

1—36x36 Jeffrey Sgl Roll
1—12x16 Eagle Dbl Roll
1—18x20 Eagle Dbl Roll
1—420'x26" SA Comb. Scraper & Bucket Conveyor or w/o MT'r, Ideal for tipple or dock.
2—24"x60' SA porta. conveyors, AC mt'r
1—(New) NOLAN Porta. feeder
1—22"x66" SD-RS Roots Connersville Positive Pres. Blower output 95 CF per. Rev. Complete with 100 hp. AC MT'r and controls.
1—3 yd. Sauerman Scraper Bucket System
1—75'x28'x20' high Steel Building

126 So. Michigan Ave., Chicago 3, Illinois

HAWKINS & COMPANY
TELEPHONE HARRISON 7-0725

PIONEER complete semi-portable Crushing Plant, 36" x 42" RB. Jaw, 24" x 36" RB. Jaw, 40" x 22" RB. Double rolls, (2) 4' x 15' 2-deck screens. Conveyors. Murphy Diesel Power. Late modern. Sell whole or split up.
IOWA 24" x 40" RB. Jaw Crusher. Guaranteed like new. Only been used 75,000 tons soft limestone. $9500.00 (Fact. price $15,240.00). Can furnish apron feeder 40" x 12 ft.—Rental purchase.
UNIVERSAL 26" x 36" RB. Jaw Crusher with 26' x 8' Apron Feeder. Guaranteed like new. $7500.00. Rental purchase. Dismantling 20" x 36" stationary plant—Only been used three seasons. Complete with Diesel power, Conveyors, Hammermill, Vibr. screen, scales, etc. Al. $20,000.00, or split.
IOWA 21" x 40" RB. Portable Primary, D-13000 Cat. Diesel. Apron feeder, undercover. $18,500.00. Also secondary portables, double roll or hammermill.
IOWA 20" x 36" RB. Primary Portable D-8600 Diesel. Good. $16,000.00.
IOWA Scalping Units, porta. e. BBB #1036.
UNIVERSAL 2'8'50 pr. GRAVELMASTER & TWIN DUAL Master.
Jaws for Iowa 20" x 36" RB. New. Set $400.00.
IOWA 4' x 12' 2-deck Horizontal Screen. Guaranteed. $1900.00.
TELLSMITH 5' x 12' 2-deck. $1650.00. Also 3-deck.
SIMPLICITY 3' x 10' "SS"-2-deck. New. $1300.00.
SIMPLICITY 5' x 8' "OM"-3-deck. New. $3500.00.
IOWA #4033, Nos. 3 & 4 Universal Hammermills.
PIONEER 16" x 24" RB, Double Roll. Like new. $1600.00. Others.

WENZEL MACHINERY RENTAL & SALES CO.
2136 Jefferson Street, Kansas City, Mo.
Tel. Harrison 0021

SPECIAL OFFERING

1—New Acme 16" x 5' heavy duty reciprocating feeder—stock delivery.

1—Factory rebuilt Acme 18 x 32 Jaw crusher.

ACME ROAD MACHINERY COMPANY
Frankfort, New York

APRON FEEDER: 1—54" x 16' heavy duty, manganese.

GYRATORY CRUSHER: Allis Chalmers 10-K.

CRUSHERS, JAW: Sizes 12" x 15" to 48" x 60".

CRUSHERS, REDUCTION: Symons, Telsmith, etc. 2', 3', 4' and 5½'.

HAMMER MILL: Cedar Rapids #4033, portable, 36 x 36" steel apron feeder, 5 yd. steel bin, 30" x 19 ft. discharge conveyor, with or without 260 H.P. V-Belt, General Motors power unit. New 1949, condition like NEW.

MINE HOISTS: 1—Vulcan single drum 2' dia., 2'6" face, 75 H.P., 220 volt, NEW condition. 1—150 H.P., 6'6" dia., 6'8" face. 1—Vulcan double drum, 8' dia., 4' face, one clutched, 200 H.P. motor. 1—250 H.P., 72" dia., 48" face. 1—950 H.P., double drum, 14' dia., 6'10" face, 1⅛" rope, 1500 FPM, complete with motor and controls. All 3 phase, 60 cycle, 2200 volt, with control equipment. Other hoists 100 H.P. to 1050 H.P., single and double drum, with electrical equipment. Head Frame for double shaft 16'9" x 17'2", height 55 ft., with or without 8 ft. dia. sheaves for 1⅛" rope.

COMPRESSORS: Worthington DC2, 29/13⅛ x 21, motor 600 H.P. synchronous, 440 volt, with all auxiliary equipment. 4—Ingersoll Rand Diesel portable, 500 cu. ft. @ 100 lbs. pressure, New 1951.

DIESEL MOTOR: Caterpillar D13000 portable on skids, 122 H.P.

DRYERS & KILNS: 2—Kilns 7'6" x 7' x 125 ft., complete with all auxiliary equipment, including Fuller movable grate type Coolers with all auxiliary equipment. 2—10 ft. x 90 ft., heavy duty, with or without auxiliary equipment, condition like NEW. One located in Minnesota. 1—10 ft. x 25 ft. and one 5 ft. x 50 ft.

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PULVERIZERS: Hardinge 5' x 22", steel lined, Ball Mill, complete with disc feeder and 30 H.P. motor. Marcy 8' x 12', Rod Mill, double end, center discharge 350 H.P. motor. 2—5' x 14' Marcy open end Rod Mills.

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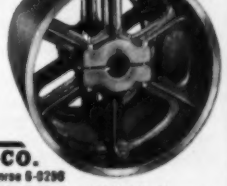

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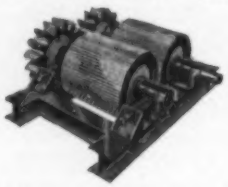

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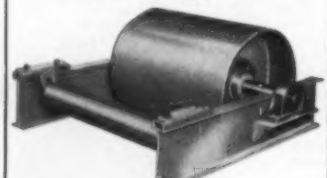

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CLYDE HYDRATOR WITH KUNTZ CONTINUOUS DUSTLESS SYSTEM, 4-5 T.P.H.
#1 RAYMOND AUTO PULVERIZER WITH THROWOUT, SEPARATOR & CYCLONE.
KUNTZ 5 x 20 CONTINUOUS HYDRATOR.
3 ROLL BRADLEY HERCULES JR. PULVERIZER.
4 x 20 & 4 x 45 & 6' x 60' ROTARY KILNS OR DRYERS.

2 ROTARY KILNS
5'6" x 7'0" x 60'0"

SHELLS FOR ROTARY KILN OR DRYERS
24 Ft. - 8'0" Dia. - ⅜" Plate
30 Ft. 6'0" Dia. - ½" Plate

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RUGGLES COLES A-10 DRYER 70" x 33' DOUBLE SHELL.
WILL CONVERT TO SINGLE SHELL, PARALLEL FLOW.

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30	INCH	1-136'—1-270'—2-350'—1-418'—2-500'—1-1100' & 2-1500' Long.
36	INCH	1-160'—2-250'—1-320'—1-400'—1-590'—2-1000' & 1-1600' Long.
42	INCH	1-144'—1-290'—1-377'—1-575'—2-700'—1-800'—2-1500' Long.

3 SURPLUS NEW VIBRATING SCREENS
ALLIS CHALMERS 6' x 14'—2 DECK RYPL-FLO.

10 SURPLUS MERRICK E WEIGHTOMETERS
1 for 24 In. 8 for 30 or 36 In.
1 for 42 In. Belt

CRUSHERS
42 x 48 AC Superior Jaw.
24 x 36 Farrell Jaw.
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135—2 yd. 24 & 36 ga. V shape.

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1 24" x 72' Channel Frame Conveyor with 7½ hp motor and reduction gear.

1 Robbins Gyrex 48" x 102" Screen with motor, Model C-9, being used as scalping screen, can be converted to 2 deck.

1 New Holland 8' x 8' 30" Apron Feeder, complete with motor.

1 36" x 12' Channel Frame picking belt, with motor and reduction gear.

1 Standard Cemco 23 cy Straight Leg Bin.

1 TE 25 hp, 1150 RPM Diehl Motor 220-60-3 phase with base rails and v Belt pulley 8 groove.

1 20T Standard 9' x 20' Platform Scale.
All necessary Magnetic switches, fuse boxes, etc., to install the above using 220-60-3 phase circuit.

1 3 M-Barnes pump (new).

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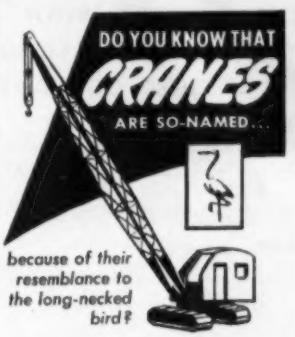

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THIS MONTH'S SPECIAL CRAWLER CRANES

1—Mdl. 501 Koehring #1071, 60', 70', 80' boom, 18' jib, Mdl. K Wisc. gas eng. Cap. 40,000# @ 12'. Wt. 97,200#.

1—Mdl. 78 Lorain 1½ yd. Crawler Crane, Ser. 11281, power 150 HP Cat. Diesel Mdl. D-13000, 90' boom, 20' jib, high gantry. Wt. approx. 75,000#.

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1—500' Ing. Rand #40-T-29621, Mdl. K500, 100# pressure, 6 cy. Wauk.-Hesselman Diesel eng. Mdl. 6-WAKH, mtd. 4 pneu. tires. Wt. 10,000#. $8,000.

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1—Mead Morrison #952, 7½ HP 3/60/220 motor to handle 1 to 5 loaded cars.

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1—25 ton Industrial Brownhoist Type G 40-50-60' boom, Natl. Board Boiler, 150#.

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2—10-15 ton all steel stiffleg derricks, 60' booms, 10' bullwheels, hook or clam work.

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3—60 HP 2/drum Thomas, attached swingers, Sers. 9177, 9176, 7934; 2 powered by 60 HP G.E. slipring motor 220/440/60/3; one without power. Cap. 7000# @ 200 FPM.

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1—10x12 double drum Mead Morrison. 16,000# @ 150 FPM. Wt. 17,000#. $3,500.

LOCOMOTIVE, 15 TON, STD. GA.

1—15 ton Vulcan Std. Ga. Gasoline Powered Locomotive, Ser. 3903, power 6 cyl. Mdl. JMS LeRoi gas eng. Wt. 30,000#.

PUMPS

1—New 3" suction 2" discharge Dayton Dowd (Peerless) 15 HP 3/60/220/440, 80 GPM @ 300', 140 GPM @ 210', 220 GPM @ 100'.

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PITTSBURGH 30, PA.
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3—6' x 60' Vulvan Iron Works, complete; each with or without 3' x 50' Rotary Cooler. By installing lifting flights these kilns would make excellent heavy duty dryers.

1—7' x 45' Link Belt Kiln, complete; 1—7' x 120' Vulcan Iron Works; 1—8' x 135' Allis-Chalmers.

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3—#5047 Raymond High Side, 4 rolls, one mill equipped with "whizzer" type air Separator and oil journals; both mills equipped with Raymond exhausters, cyclones and inter-connecting piping.

2—#5047 Raymond 5-roll High Side, each with double cone vacuum air classifier, #11 Raymond exhauster, cyclone collector, inter-connecting piping and 2—50 H.P., 3/60/2200 volt motors, one for the mill and one for the exhauster.

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6—No. 1, #0, 00, 000, 0000 Raymond.

3—#0, 00, and 8" Raymond Screen Mills.

4—Mikro #2SI, 2TH, 4TH.

ROTARY DRYERS:

1—2'7" x 10' Link Belt Roto Louvre, complete.

4—Ruggles-Coles Direct Heat; Class XF4-54" x 25'; 2-Class XF 5' x 40'.

4—4' x 30', 5' x 30', 6' x 40', 6' x 60'.

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1—70' x 70' Louisville, Type L, direct heat.

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1—4'6" x 7' Ball Mill, Allis-Chalmers, iron lined, used 100 hours.

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1—4' x 10' #38 Tyler 2 decks with m.g. set.

3—Selectro 3' x 6' 2-deck, 1—3' x 6' 1-deck, all totally enclosed, heavy duty.

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2—Raymond 6' and 16' dia., 1—8' Gayco; 1—16' Sturtevant.

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1—42" x 16' Allis-Chalmers, Type B.

1—24" x 32" Penna. Single Roll, with motor.

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1—7' x 30' UNUSED Dorr Twin Rake Classifier.

2—Two stage Washing Classifiers, each with two rakes in tandem, in steel trough 26'6" long x 3' wide, with drives.

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120-B BUCYRUS ERIE Shovel, 5 yard
EUCLID Rear Dump Trucks
42-T BUCYRUS ERIE 9" Drill
80-D NORTHWEST Shovel, 2½ yard
54-B BUCYRUS ERIE Shovel, 2½ yard

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BOOMS for 80D Northwest. One crane boom 65', and one dragline boom 75', complete with 2½ yard bucket.

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BOX NO. S-4, c/o Pit and Quarry Publications
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Locomotives — Diesel — Gas — Fireless
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1—6" 2—4" 1—2" Humdinger self priming pumps on steel wheels.

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1—D4 Caterpillar Dozer with Angle Blade & Wench, Good Condition & Recently Overhauled. Serial No. 5T4226.

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SWING HAMMER MILLS.
ROTARY FINE CRUSHERS—#1, #1¼ and #2.
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1—6' Raymond "Whizzer" Separator
1—4' x 8½'—3 deck Robins "Cyrus" screen
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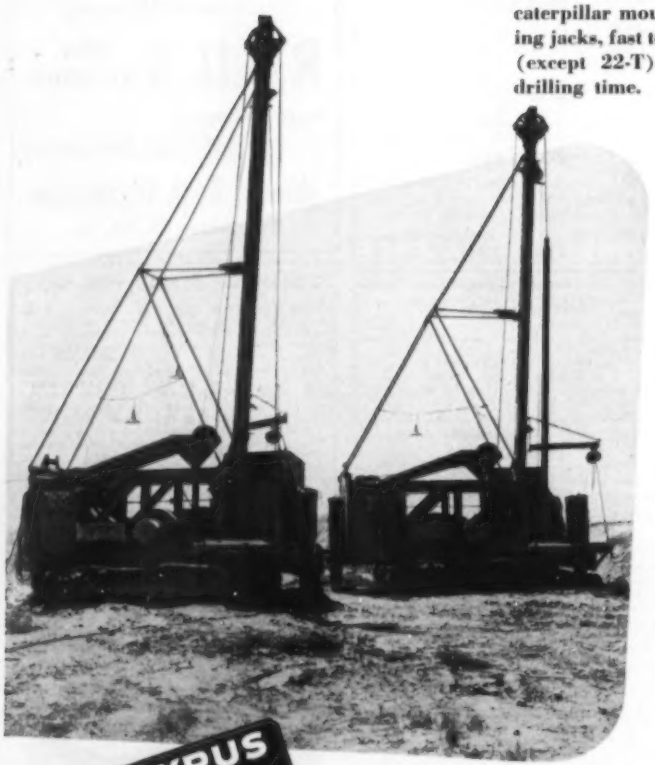

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27-T	6" to 6⅝" holes
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42-T	9" to 12" holes

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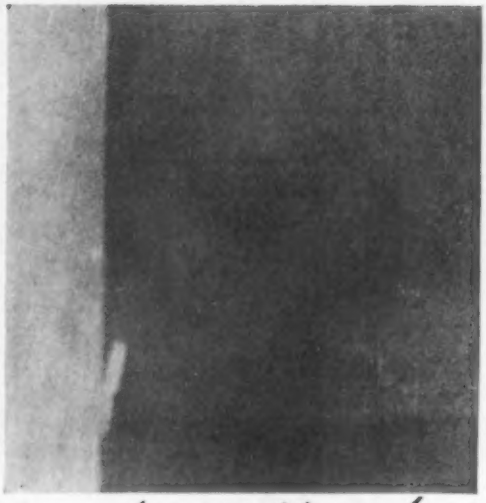

The photo that couldn't be taken

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Crushing trap rock is a dusty operation . . . but we never realized how bad it is until we sent a photographer to secure some "before" and "after" shots of Johnson-March dust control systems at work.

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"With the Johnson-March liquid diffusion system (installed one year ago) tests show that dust has been cut 80 to 90 per cent."

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Farval eliminates human element in jaw crusher lubrication

DAY in, day out, this 36″ x 54″ jaw crusher reduces bulky slag for final processing, creating a punishing load on vital bearings. To keep these bearings from overheating, one man was employed practically full time at lubrication.

Then Farval's "better-than-human" centralized lubrication system was installed on the crusher. Resultant savings in manpower and lubricating maintenance prompted Buffalo Slag's plant engineer to write: "Because of the crusher's need for constant lubrication, it had been necessary to use a workman almost continuously pumping lubricant. Need for this man has now *been eliminated with the use of the Farval automatic system,* and we now have the assurance of constant and proper lubrication, eliminating the human element!"

Farval is the original Dualine system of centralized lubrication for industrial equipment, proved practical in over 25 years of service. The Farval valve has only two moving parts—is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble. Through its full hydraulic operation, the Farval system unfailingly delivers oil or grease to each bearing—as much as you want, exactly measured—as often as desired. Indicators at all bearings show that each valve has functioned.

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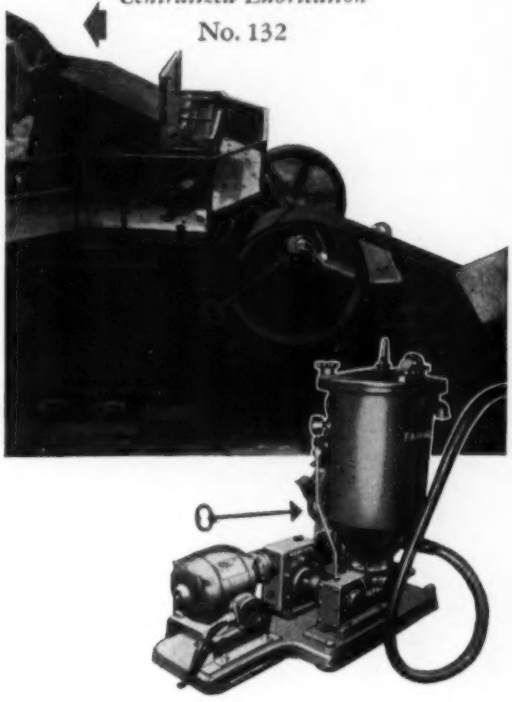
Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

FARVAL—*Studies in Centralized Lubrication*
No. 132



KEYS TO ADEQUATE LUBRICATION—*Wherever you see the sign of Farval—the familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine will be properly lubricated. Farval manually operated and automatic systems protect millions of industrial bearings.*

Pictured is Birdsboro-Buchanan jaw crusher installed at the processing plant of The Buffalo Slag Co., Woodlawn, N.Y. Illustration by courtesy of Pit & Quarry.

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For chassis lubrication, use *Texaco Marfak*. It's longer lasting – won't jar or squeeze out of bearings. Parts last longer. *More than 400 million pounds of Texaco Marfak have been sold!*

For wheel bearings, use *Texaco Marfak Heavy Duty*. It seals out dirt and moisture, seals itself in. Won't leak onto brakes. No seasonal change required.

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